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[1] Based on IBM testing and documented in IBM System x® Virtualization Server Consolidation sizing methodology. IBM Flex System x240 supports 2.7X more Peak Utilization Virtual Machines (VMs) than previous generation BladeCenter® HS22V.

[2] Based on IDC white paper "The Economics of Virtualization: Moving Toward an Application-Based Cost Model," Michelle Bailey, November 2009, http://www.vmware.com/files/pdf/Virtualization-application-based-cost-model-WP-EN.pdf

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FROM THE EDITOR JOHN DIX

The approaching BYOD wave

This holiday shopping season is being powered in part by demand for electronics, including boatloads of new tablets and smartphones, most of which will wash into enterprises in early January in a veritable bring-your-own-device (BYOD) tsunami.

Besides the latest and greatest smartphones, such as the sleek Samsung Galaxy S III, the Apple iPhone 5 and devices powered by Windows Phone 8, a raft of sexy new tablets will appear in the office, everything from the Apple iPad Mini to Google's Nexus 10, the Samsung Galaxy Tab 2, Microsoft's Surface and the Kindle Fire from Amazon.

More than 75% of gift-giving adults plan to purchase consumer electronic products as gifts this year, according to the Consumer Electronics Association, and during Christmas alone some 32 million tablets will be sold in the U.S., up more than 110% from last year.

Chances are your organization isn't ready for the onslaught. In a *Network World* survey last summer only 16% of the participants said they have BYOD policies in place, which is a basic building block for BYOD given the need to spell out rules regarding use of personal devices to access corporate resources, security expectations and requirements, personal rights, etc.

If only 16% have taken this rudimentary step, we can assume companies: 1) are hoping against hope employees will heed the corporate ban against using personal devices for anything work related, 2) have faith that the security controls they have in place can prevent said use, 3) don't perceive it as much of a threat, 4) don't have a grasp of the magnitude of the problem or the risk, or 5) a mix of 1-4.

Anecdotal evidence would suggest that, other than highly secure organizations that are locked down, most organizations fall into the fifth camp. They realize BYOD is happening whether sanctioned or not, they have some controls in place that provide a bit of cover, but they either think the benefits outweigh the risks or simply aren't sure how much exposure they have.

Our guess is that getting a better handle on BYOD will top many IT New Year's resolution lists (see "Seven BYOD policy essentials," tinyurl.com/c8z7p5z). After all, the IT implications are big and multifaceted, touching on everything from wireless network performance to questions about compliance, support, productivity, IT costs and even worker satisfaction.

The latter is important because, as hard as it may be to get BYOD right, it offers IT the chance to ride the wave rather than try to create it. In other words, BYOD creates a great opportunity to keep employees engaged, which, in turn, should help other IT initiatives, including collaborative/social endeavors.

No use trying to hold back this tsunami.

John A. Dix

inside

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bits

Don't book that cruise yet

IS THERE AN end-of-year bonus in your future? IT pros are divided when it comes to bonus expectations, according to tech jobs site Dice.com. On the optimistic front, 37% of bonus-eligible IT workers believe they're in line to earn a bigger bonus than they did in 2011. Another 33% said their bonus would be unchanged. The disappointed remainder expect to take home a smaller bonus (18%) or not get one at all (12%). **tinyurl.com/cjbonqa**

IT VIDEO

Photo booths watch you

FanShots kiosks snap pictures, mine social data and use Kinect sensors to record user behavior. ***tinyurl.com/cocqol6***

Google Play gains on Apple App Store

APPLE'S APP Store has the edge in mobile application store volume, but Google Play — the combined Android and HTML5 app store — is on a growth spurt. Revenues from apps sold in Google Play grew 17.9% in October compared to the previous month, while iOS App store sales shrank 0.7% in the same period. Compared to a year earlier, Google Play revenues grew 313%, while iOS App Store revenues grew 12.9%. But iOS App Store revenues still were four times larger than Google Play's, according to the App Annie Index. "The gap between global revenues on iOS and Google Play is still there," said Bertrand Schmitt, CEO of App Annie. "But the gap is shrinking every month." ***tinyurl.com/c2qztpd***

And you thought Sandy outages were bad

THE U.S. is in urgent need of a nationwide strategy to protect its vulnerable electric grid from succumbing to a cyberattack that could cause more damage than Hurricane Sandy, a new report concludes. Terrorists who gained access to any one of a number of key facilities could black out large regions of the nation for weeks or months, the National Research Council says. The grid's acute vulnerability comes from being spread across hundreds of miles, having many unguarded key facilities, and being riddled with decades-old equipment that lacks advanced technology for sensing and control. "Considering that a systematically designed and executed terrorist attack could cause disruptions even more widespread and of longer duration [than Hurricane Sandy caused], it is no stretch of the imagination to think that such attacks could produce damage costing hundreds of billions of dollars," said M. Granger Morgan, head of the engineering and public policy department at Carnegie Mellon University and chairman of the committee that wrote the report. ***tinyurl.com/cy35q95***

A map with one direction ... out

APPLE REPORTEDLY has fired Richard Williamson, the executive in charge of its mapping software, in a bid to get the troubled but strategic project back on track. Apple Maps made a disappointing and controversial debut in September, as part of iOS 6 and iPhone 5. The new platform was criticized for unreliable searches, for routes and directions that led users astray, and for its absence of directions for public transit services. The flood of complaints led to a public apology from Apple President and CEO Tim Cook. tinyurl.com/***bphf2g7***

Alcatel-Lucent joins the SDN crowd

ALCATEL-LUCENT'S ENTERPRISE division jumped into SDN last week with a strategy to fortify its products to enhance network programmability and virtualization. The company is augmenting its Application Fluent Network strategy with a software-defined networking plan that goes beyond application awareness and network configuration to full automation and real-time tuning to improve user experience and operational routines. SDN-focused enhancements to the Alcatel-Lucent OmniSwitches' Application Fluent Networking capabilities include: increased programmability through integration with external controllers and orchestration platforms such as OpenStack and CloudStack; improved application profiling; and enhanced global control through identification and automatic service activation of each networked device. With its SDN strategy, Alcatel-Lucent will go up against Cisco with its Cisco ONE products, VMware with its recent Nicira acquisition, and Big Switch and its partners, as well as IBM and HP in the OpenFlow camp. ***tinyurl.com/bn4p76h***

OmniSwitch 6900

Cisco buys network planning company

BETTER VISIBILITY of IP/optical WANs is the driver behind Cisco's $141 million acquisition of Cariden Technologies. Cisco plans to integrate Cariden's capacity planning and management tools for IP/MPLS networks with its own nLight technology for IP and optical convergence so service providers can enhance the visibility and programmability of their converged IP/optical networks. The Cariden acquisition also supports Cisco's Open Network Environment network programmability strategy by providing WAN orchestration capabilities across the IP and optical transport layers. ***tinyurl.com/bpc5x7y***

Hacking cloud compute time

A TECHNIQUE based on MapReduce could let hackers hijack computing resources used by cloud-based mobile browsers and use them anonymously, says security researchers from North Carolina State University and the University of Oregon. The team tested its idea by storing pieces of data on URL shortening sites, effectively tricking both those sites and the cloud browser providers into performing computations for them. Used maliciously, the technique could provide hackers with vast, temporary and completely anonymous computing horsepower, allowing them to crack passwords or perform other nefarious tasks at great speed, says NCSU assistant professor William Enck. Depending on the scale of the attack, users may not notice anything is going on. "Cloud browser operators who are monitoring resource use will definitely notice a spike in service use. However, reacting to these jobs requires the operator to build additional defenses into their framework," Enck said. ***tinyurl.com/cxt7vom***

SaaSy legacy apps

COMPANIES ARE not only buying into SaaS more than ever, they are also ripping out legacy on-premises applications and replacing them with SaaS, according to Gartner. "In the past 12 months, Gartner has seen a decline in the proportion of SaaS deployed to augment existing applications," the firm says. It found regional patterns, with SaaS replacing existing systems in mature markets, while often being the first business solution implemented in emerging markets. A majority of respondents in all regions said they planned to increase their investments in SaaS. ***tinyurl.com/btpjquh***

good

Black Friday boosts economy

ONLINE SALES on Black Friday, the day after Thanksgiving, topped $1 billion for the first time, giving the economy a nice year-end boost. ComScore says that online shoppers, many scarfing down tech products such as tablets, had spent $13.7 billion between Nov. 1 and late in the month, a 16% increase over the comparable period in 2011.

bad

Google's big non-acquisition

NEWS OUTLETS raced last week to publish stories on a big Google acquisition of a little-known WiFi company called ICOA. But the story turned out to be bogus, the result of a hoax press release that investigators suspect was designed to pump up ICOA's stock price for financial gain by swindlers. Later in the week, Google actually did announce the acquisition of promotions platform firm Incentive Targeting.

ugly

Amazon's re:ally ugly show name

GIVE CREDIT to Amazon for putting on what by most accounts was a solid first customer conference in Las Vegas last week, but "AWS re: Invent"? We hope they re: Invent a better name of the confab next time around. (Maybe iNvent was already taken by a certain Amazon tablet competitor?)

APPLE STORE PHOTO STEPHEN LAM / REUTERS APPLE SHOPPER BRET HARTMAN / REUTERS

peersay

Advantages of BlackBerry 10

BLACKBERRY 10 HAS a huge advantage. First off, BB10 runs its messaging system in the background all the time. You see notifications without exiting an app, and you can take action immediately, or put it off, but either way, the app never closes. Second, BB10 has way more prospects than iOS or Android in that RIM is planning on setting up a huge M2M system. This is possible since QNX (the bones of BB10) runs on systems all over the world. I could also mention the best Web browser available, multitasking, and BB's loyal 80 million users (Re: "BlackBerry 10 to the Rescue? I Think Not"; tinyurl.com/bufev7h).

By the way, saying operating systems don't matter is kind of like saying no one cares for brands. In which case, why do we still have a million and one different cars? They all do what we want ... Could it be because people like choice and options?

pHred

Open source angle on M&As

NOTHING COMES FOR free in this world because no one is working for free. Therefore I believe there is no true open source; it is just a matter of who is behind the project (Re: "What Cisco and Dell's Cloupia and Gale acquisitions mean to the future of IT"; tinyurl.com/bnyukwo).

All I am concerned about is true open standards. I would like to have an open/standard path for my private/public cloud to move from one vendor to another whenever I want for various reasons. I believe this will be possible when more consumerization happens like Linux. For now we need to deal with different islands like VMware, Microsoft, OpenStack, CloudStack, Eucalyptus, Cloupia, Gale, etc.

RV

> **There is no true open source;** it is just a matter of who is behind the project.

Cyber-ethics book by the numbers

OK, THE BOOK sounds like a great idea. But the numbers just don't add up... (Re: "The Petraeus scandal and computer ethics"; tinyurl.com/d2bdquu).

Paper only! Really? His chances of distributing 1 million copies would be more achievable if there was also an e-copy (in multiple reader formats).

The U.S. census says there are over 14,000 school districts. One million books means an average of 71 books each. Unless they are all one-room schoolhouse districts, the books are not going to reach people who need them. That excludes all of the other people on the mailing list (politicians, etc.).

Heck, the postage on 1 million books is going to be more than $4 million. And who is going to pay to print these high-quality books?

So the subscription to support this worthwhile effort sounds like a way of getting other people to pay for his publicity effort to sell a lot more copies to all of these schools.

Ron007

We need a book on computer ethics to teach our children about the evils of "hacking, sexting, bullying, theft, privacy, pornography, scams and phishing, and plagiarism"? That is a very sad comment on the state of our society.

I thought that such moral issues are supposed to be taught by parents, and apply to all facets of our lives, not just our computers.

Mark Newman

Devices more than sum of their specs

IT SOUNDS LIKE this article was written before the author used either phone, and the article is based on written specs. How are you going to compare two devices when you've not even used them (Re: "iPhone 5 vs. the HTC One X"; tinyurl.com/8fmsezc)?

The truth is in actually using these devices, side-by-side, or better yet, using each of them exclusively for a week or so, so as to really get a sense of what the features are, and learning what it's like to actually live with each of them on a daily basis. As such, I can't really take this article very seriously (and I'd have liked to).

Eric Hope

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492 Old Connecticut Path, P.O. Box 9208
Framingham, MA, 01701-9002
Main Phone: (508) 766-5301
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Microsoft jacks up client license fees

BY TIM GREENE

MICROSOFT WILL make businesses pay 15% more for licenses that let workers access servers from as many devices as they want, which — depending on how workers do their jobs — may still be cheaper than the alternative.

The new fees went into effect Dec. 1, but existing support contracts that extend beyond that date will be honored at the old rate until the contracts expire. Meanwhile, IT execs should check out how their workforces actually use endpoint devices to access servers in order to sign up for the best deal, says Paul DeGroot, principal consultant at Pica Communications.

He gives a pricing example for a single user with a corporate desktop who also accesses the Exchange server from outside the office, sometimes using a laptop and sometimes using a smartphone.

If the business supported that worker with CALs for each device it would cost $297. Supporting the same worker with a CAL that allows using unlimited devices costs $114 — and that's with the 15% increase, DeGroot says.

Sometimes, it's less expensive to buy a device license when it is used by many different workers to access the same servers. So a CAL for a workstation in a hospital that is used by multiple doctors and nurses during the day could cost less than licensing each individual who uses the machine.

Some businesses will use a mix of CALs, he says. DeGroot uses the example of a mining company where devices in field offices are used by many workers but workers at headquarters may each use multiple devices. In that case it might make sense to decide which type of CAL to buy based on location. "It may not perfectly reflect their requirements, but since CALs are fiendishly difficult to track — they don't actually exist, since they're not software — it may be easier to manage by location," DeGroot says in an email.

Customers have to specify whether they want user or device CALs and how many of each when they sign up for Software Assurance contracts, he says.

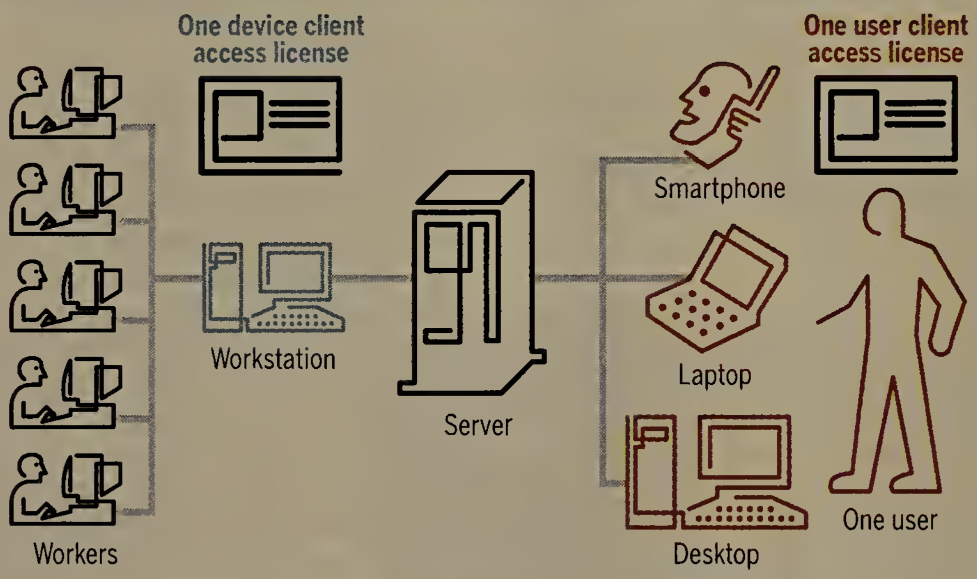
The 15% price hike might be explained by the proliferation of devices individuals use, he says. "This is a predictable response to the massive growth of multiple devices per user in the workplace," he says.

The hike is significant for Microsoft because the bulk of revenue from some server products comes from the CALs, not the price of the server, according to DeGroot. "So, if Exchange is a billion-dollar business, which I'd guess is conservative, $800 million comes from CALs, and if half of those people switch to user CALs the revenue boost would be at least $60 million," he says.

These licenses apply to server CALs for Bing Maps, the Core Suite, the Enterprise Suite, Exchange Server (standard and enterprise), Lync Server (standard and enterprise), Project Server, SharePoint Server (standard and enterprise), System Center 2012 Client Management Suite, System Center Configuration Manager, System Center Endpoint Protection, Visual Studio TFS, Windows MultiPoint Server, Windows Server and Windows Server RDS, RMS, Terminal Services, according to a blog by Softcat, a Microsoft reseller. ■

Microsoft customer quandary: license devices or license users?

Microsoft's price increase for licensing client software per user should prompt a review by businesses of how they use these licenses. Here is a graphic showing when a user license makes sense and when a device license makes sense.


One device client access license
Workers
Workstation
Server
Smartphone
Laptop
Desktop
One user client access license
One user

Microsoft: Windows 8 adoption will take a while

Business adoption of Windows 8 won't happen overnight and will likely involve a gradual phasing in alongside Windows 7 rather than a wholesale enterprise-wide swap-out of one operating system for the other, according to Microsoft's chief marketing officer for Windows.

Windows 8 represents a generational shift in how Microsoft regards the relationship among the operating system, hardware and applications that will take time for customers to understand and adapt to, says Tami Reller, who serves as CMO and CFO of Microsoft's Windows and Windows Live division.

TAMI RELLER

At the moment available hardware in retail stores and apps designed specifically for Windows 8 are still ramping up, Reller told analysts at the Credit Suisse technology conference, but they lag behind where they need to be.

While there are some compelling Windows 8 hardware options for sale already, "It's not enough in our opinion. ... I think it's good but not great in terms of the full touch assortment," she told the conference.

▶ **See Microsoft,** *page 10*

Amazon launches cloud database with analytics

BY BRANDON BUTLER

AT ITS first user conference, called AWS re: Invent, Amazon Web Services today launched its newest cloud-based service, called Redshift. Meant to be a petabyte-scale data warehouse, Redshift allows businesses to drop their data warehousing costs by 10 times compared to on-premise systems, AWS officials say.

Redshift has launched in a limited beta and is expected to be fully rolled out next year.

Redshift is aimed directly at on-premise data warehousing systems, most notably from Oracle, SQL Server and Greenplum. "All these guys are suddenly confronted with a new full-featured SQL interface completely in the cloud with dramatically lower pricing," says Merv Adrian, a Gartner analyst who tracks big data. "This is a potentially massive disruption for traditional data warehousing vendors, but it can't come as a surprise."

In addition to Redshift, AWS also announced another reduction of its prices, this time for its Simple Storage Service (S3) in what amounts to an average 25% price cut for most S3 services.

Redshift is meant to be a cloud-based system where users can set up, manage, monitor and back up large-scale data warehouses. It's optimized for columnar data storage and structured data and takes advantage of advanced compression techniques to leverage high input/output functionality. AWS also says a variety of partnering business analytics tools are integrated to work on top of Redshift, taking advantage of parallel queries across clusters of some of the cheapest virtual machine instances AWS offers. Initial analytics partners include Jaspersoft and MicroStrategy.

Redshift is priced in two node types, 2TB or 16TB versions, with on-demand pricing starting at $0.85 per hour, with less expensive rates for longer-term reserved instance commitments. AWS says traditional on-premise data warehousing tools can run between $19,000 to $25,000 per year per TB, while Redshift can be as little as $1,000 per year per TB.

Redshift will fit in with AWS's other data storage products, the most popular of which is S3. AWS launched Glacier earlier this year as a long-term, inexpensive storage option. AWS also already has DynamoDB, which is a solid-state drive-managed NoSQL database that is highly scalable and fault tolerant. It also has Elastic MapReduce, which is a Hadoop-based analytics platform. MapReduce allows users to spin up scalable Hadoop clusters using Amazon's Elastic Compute Cloud (EC2) and S3. It's used for Web indexing, data warehousing, machine learning, data mining and log file analysis, among other tasks, Amazon says.

There are a variety of third-party tools already on the market that provide big data analytics. AWS recently launched a "Big Data" section on its Marketplace, which are applications that are designed to run on Amazon's cloud. SAP's HANA One, Sumo Logic, Metamarkets and Splunk Storm are some of the apps designed for big data analysis already on Amazon's Marketplace. AWS also already partners with companies like Think Big Analytics, MarketShare and MapR for its Elastic MapReduce function.

Gartner's Adrian says he expects businesses of all sizes to aggressively investigate potential use cases for Redshift, but traditional concerns around what sort of data business are comfortable storing in the cloud versus on their own premises will persist.

In addition to Redshift, the other major announcement from the first day of AWS's user conference was another price reduction, this time for its S3. This follows a drop in prices for EC2 instance types just a few weeks ago. S3 instances dropped on average by 25% across the board. Up to 1TB of data stored in Amazon's cloud has dropped in price from $0.125 to $0.095 per GB, a 24% drop. Up to 4000TB of storage dropped in price from $0.08 to $0.060, a 25% drop. ■

▶ **Microsoft,** *from page 9*

As for Windows 8 business tablets, "there are scenarios where that's going to make a ton of sense and we feel really good about our offerings there for enterprises today and what's to come from our OEMs," Reller says.

She says she expects more options to crop up in the next few months because Microsoft has certified 1,500 Windows 8 devices proposed by partners, and in January Microsoft itself will come out with its Surface Pro tablet/laptop that supports both traditional Windows 7 apps and Windows 8 Store apps.

She says it will take time for business customers to write line-of-business apps for Windows 8 and its touch environment, and that will further delay widespread Windows 8 enterprise adoption, but those apps will be a powerful incentive for ultimately migrating to the new operating system.

She says Microsoft recognized that many businesses would still be transitioning to Windows 7 from Windows XP during the Windows 8 launch five weeks ago, making it likely that they wouldn't be up for a move to Windows 8 for possibly years.

One goal of Windows 8 design was support for making that shift gradually, Reller says. "And so we fully expected and knew that we needed to have a solution for customers to be able to really run Windows 7 and Windows 7 applications alongside Windows 8 and Windows 8 apps," she says.

Likely businesses will recognize cases where it makes sense to deploy Windows 8 to certain employees but not others based on their hardware needs and the applications they require to do their jobs. "We'll see departmental usage of Windows 8," she says. "I think that's a good way to summarize it, either scenario usage, departmental usage, people will be bringing in their Windows 8 devices into the environment, and so IT will want to support that."

She says Microsoft already has a number of business customers working on such Windows 7/8 hybrid deployments and they are working on how best to accommodate that. "They're learning and we're learning and so we'll see. I think there's a lot of potential," Reller says.

— Tim Greene

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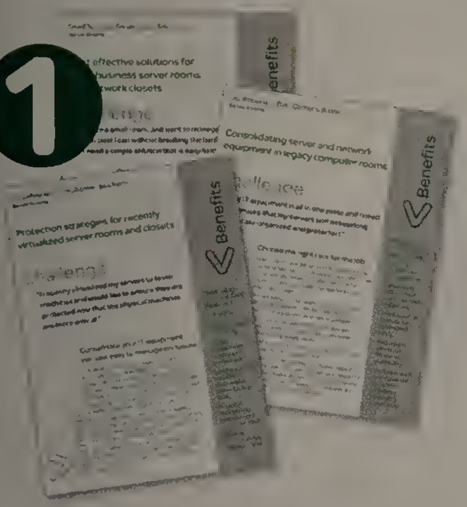

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User rankings of LTE phones reveal many options

You can buy the 'best,' but you don't have to, to be satisfied

BY JOHN COX

YOU'VE DECIDED you want to live in the fast lane, and embrace LTE. But which phone do you choose?

We looked at customer rankings and reviews posted at the carriers' sites, to assess what these users thought about the LTE phones they had bought. Rankings typically use five stars to indicate "best" or "highest satisfaction." (See slideshow online at tinyurl.com/c3n4o5m for the top five ranked LTE phones from each of these carriers — AT&T, Sprint and Verizon.)

We've also included T-Mobile's "4G" offerings, but only for its fastest service, its HSPA+ 42 network.

The good news is that you have a lot to choose from for LTE smartphones, and a wide range of prices. Of the Big Four U.S. carriers, three of them — AT&T, Sprint and Verizon Wireless — have LTE service in some areas; they offer at least nine to a dozen smartphone models (Verizon has nearly 30), and the number is growing almost monthly. They are typically priced from $50 to $370, a mix of high-end, mid-range and budget smartphones, with a two-year service contract. With the holiday season underway, carriers are slashing prices for selected models, and some are free or nearly free with a two-year contract.

Carriers sometimes offer the same makes and models, often for the same prices. Apple's first and so far only LTE model, iPhone 5, is one example. Samsung LTE smartphones are another, including the latest Galaxy S III and Galaxy Note II. Some models are exclusive to one carrier, or offered by a subset of them.

Each carrier has a core offering, sometimes a small core, based on one or two smartphone vendors, then a sprinkling of other brands. T-Mobile's high-end 4G offerings are packed almost exclusively with Samsung models. Verizon Wireless offers at least four Motorola Droid Razr models. AT&T features a trio of HTC models.

Less expensive LTE phones fall into two groups. One group is phones designed to be less expensive, with somewhat less powerful processors, lower resolution displays, lower-end cameras, possibly less internal storage, and plastic instead of metal bodies, for example. The second group is somewhat older models, released six to 12 months or more earlier. At the time of release, they may have been top-of-the-line, and often top-ranking, phones that now are being marked down. These include the older Samsung Galaxy S II, the Galaxy Note and several Motorola Droid Razr models.

To evaluate the current offerings, we visited each of the Big Three LTE mobile carriers' websites and looked at customer ratings. The websites vary in their details but generally let you see the total number of reviews, the overall score for the phone, usually the percentage of customers who recommend the model, and of course their comments. Comments can range from brief summaries like "nice phone, no problems so far" to highly detailed evaluations that include a breakdown of features or qualities.

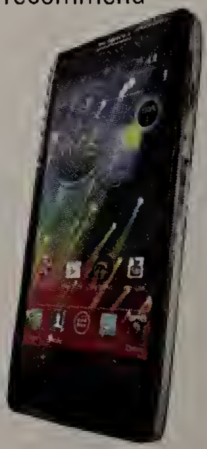
Some recently released phones have only a handful of reviews. If the new phones prove popular that number will quickly increase, so be sure to check the carrier's smartphone pages. You can usually filter your search results, for example, selecting "LTE" (or "4G" or "4G/LTE"). Caution: there's no formal definition for "4G" and carriers offer HSPA+ phones, which can deliver very good download speeds as tests of T-Mobile's network have shown. If you want an LTE phone, check the product page to confirm "LTE" is listed.

We also checked the smartphone ratings by Consumer Reports. CR gives high marks to Apple iPhone 5; HTC EVO 4G LTE, HTC One X and One S; LG Viper; Motorola Droid Razr, Razr M, Razr Maxx; Samsung Galaxy Nexus, Galaxy Note, Galaxy S III, Galaxy S II Skyrocket, Galaxy S Blaze. A number of the most recently released phones, including, for example, the Samsung Galaxy Note II and Droid Razr Maxx HD, have not yet been reviewed by CR.

Somewhat surprisingly, given the media attention, the iPhone 5 so far rarely makes it into the top five user-ranked LTE phones on the Big Three — in fact its highest ranking was on Verizon at No. 5 with a user ranking of 4.6, and a recommendation rate of 85%. Those are solid numbers, but there are plenty of other, mainly Android, LTE

A SAMPLING OF SMARTPHONES

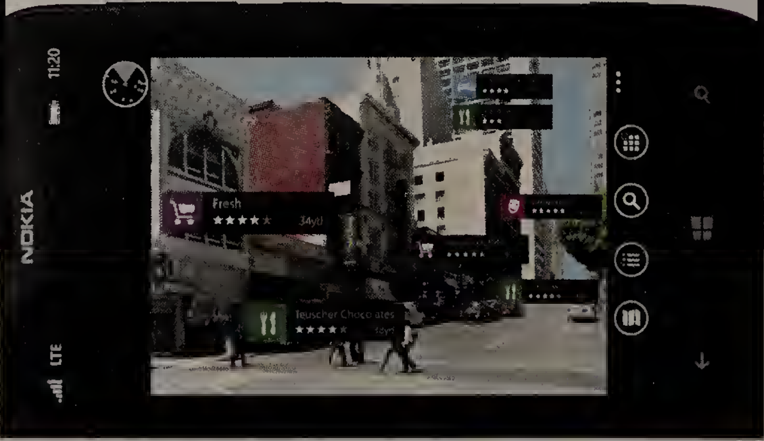
AT&T
Samsung Galaxy Note II
Android 4.1, $300, 4.8 rating, 41 reviews, 95% recommend



Verizon
Motorola Droid Razr Maxx HD
Android 4.0 upgradable to 4.1, $300, 4.7 rating, 156 reviews, 93% recommend

Verizon
Apple iPhone 5
iOS 6.0, $199 (16GB model), 4.6 rating, 809 reviews, 85% recommend

Verizon
Nokia Lumia 822
Windows Phone 8, $100, 4.7 rating, 47 reviews, 93% recommend



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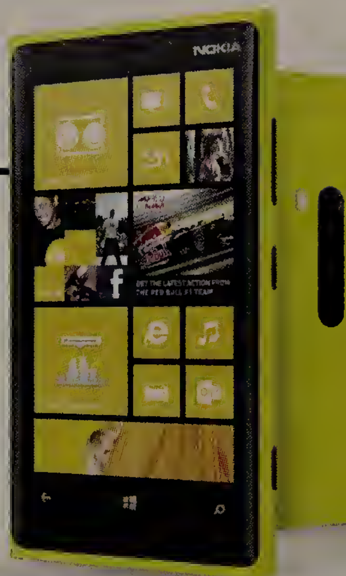
phones that have the same or better numbers from users.

The Samsung Galaxy Note II, and the older Note, both rank high: Users love the Note II's 5.5-inch screen and the Note's only slightly smaller 5.3-inch screen. The newer model starts at $300, the older at $200.

Most of the top user-ranked phones were a mix of top-end, mid-range and budget devices. In addition to the Samsung models just mentioned, there is the Sprint $200 Motorola Photon Q 4G LTE, the only user-ranked phone with a sliding full qwerty keyboard, and several Verizon-based Motorola Droid Razr models: the Maxx HD, priced at $300, and the Razr HD, at $200, and of course, iPhone 5 starting at $200 on Verizon.

But if those models are outside your budget, the lower-priced LTE phones included a number of pleasant surprises.

AT&T's Samsung Galaxy Exhilarate, designed as a low-end LTE phone, won a 4.7 ranking and a 96% recommendation rate from its 28 reviewers on the AT&T website. It's currently priced online at just $1 with a two-year contract. Users were impressed with its quality, performance, display, and the upgrade to Android 4.0. So are tech sites like PhoneDog, which concluded, "For the price, the Samsung Galaxy Exhilarate is nearly unbeatable. Sure, AT&T has better phones available, but if you're not willing or able to spend upwards of $150 to $200, then the Exhilarate is an excellent choice."



AT&T
Nokia Lumia 920
Windows Phone 8, $100, 4.5 rating, 28 reviews, 86% recommend

AT&T
Samsung Galaxy Exhilarate
Android 2.3.6 [upgraded to 4.0], $0.99, 4.7 rating, 28 reviews, 96% recommend

Sprint
Samsung Galaxy Note II
Android 4.1, $300, 4.9 rating, 90 reviews, 99% recommend

Others in this same class of less expensive, top five, user ranked phones include: Nokia Lumia 920, running the recently released Windows Phone 8 operating system and being offered on AT&T for $100, a price that one user called "unbelievable" for a phone of this quality; the Nokia Lumia 822 on Verizon for $100; LG Spectrum 2 on Verizon for $100; and Google Galaxy Nexus, by Samsung, now offered by Sprint for free via a "Web special" promotion.

Just below the top five listings, there are also some incredible deals for phones praised by users.

The Samsung Galaxy S II Skyrocket, first released a year ago, is also just $1 via AT&T and it's highly ranked by users: 4.5 ranking, and a 91% recommendation rate. Another dark horse: the Pantech Flex, for just $20 on AT&T, with Android 4.0. It has only a handful of user reviews, all 5.0, but for a budget LTE phone it's got positive spin from reviewers like Android Community, which notes that it "offers the same level of performance as a lot of current- and last-gen top-tier smartphones."

That's a theme for a lot of our honorable mentions: The tradeoffs that you have a lower-end LTE phone may not be tradeoffs that 1) you notice or 2) you care about. A lower-end camera may be plenty "good enough," for example. And a less powerful processor may still deliver all the speed you need.

One example, an "honorable mention" at Sprint, is the Samsung Galaxy Victory 4G LTE, now $50 with mail-in rebate. Its display may lack the "wow factor," as *PC Magazine* says, but one customer review says it has "plenty of resolution for the size, plenty of RAM, an S4 processor [from Qualcomm], and decent design and decent-sized battery."

Speaking of battery, users in reviews are all over the map about whether battery life is acceptable (except for users of the incredibly long-lived Motorola Droid Razr Maxx and Maxx HD models). For almost any given LTE phone, you can find reviews that complain bitterly about short battery life and others that fulsomely praise its long battery life. Overall, look at the carrier's average for "battery life" ranking for a given model. Justified or not, most of these users give LTE smartphone battery life somewhat lower rankings than other features.

T-Mobile's HSPA phones

We also checked T-Mobile for its top user-ranked HSPA+ 42 4G phones (the company's fastest offerings) with 20 or more user reviews. Here are the results:

1. Samsung Galaxy Note II, $369 with $50 mail-in rebate; 5.0 ranking, 53 reviews, 100% recommend
2. Samsung Galaxy Note, $250 after $50 mail-in rebate; 4.8 ranking, 35 reviews, 97%
3. Samsung Galaxy S III, both 16GB, for $280, and 32GB, for $330; 4.7 and 4.8 rankings, 1,200 to 1,700 reviews, 95% to 97%

Words of advice

Finally, keep in mind the following:

- A two-year contract binds you to the phone for a lengthy period.
- To get the true price of your phone, factor in the full cost of the contract and any additional one-time fees, prices for accessories, etc.
- LTE users invariably end up "doing more" with the higher connection speeds, often doubling their monthly data traffic; make sure your data cap, if there is one, fits your expected use and look for apps that can help you track usage. ■

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The hottest tech arguments

BY NETWORK WORLD STAFF AND IDG NEWS SERVICE

NETWORK WORLD and IDG News Service reporters and editors have joined forces to lay out where 15 of the hottest tech arguments of the past year stand. In most cases, good arguments can be made on both sides, whether it's using InfiniBand or Gigabit Ethernet, one vendor's browser or another's, or figuring out the best system for hiring an IT pro. Here's a sampling of three of the arguments, and you can check out the rest online.

APPLE IOS VS. GOOGLE ANDROID: IT COMES DOWN TO SECURITY

Which is more secure, mobile devices based on Google Android or Apple iOS? It's not just a theoretical question to IT professionals making decisions about the future use of smartphones and tablets in the enterprise.

Apple's locked-down approach in iOS has given it something of an edge in the debate, especially since Android's more open platform is being targeted by malware writers. Hardly a week goes by that security vendors hunting Android malware don't remind us of the growing tally, as Trend Micro recently did, claiming that Android malware surged this year from 30,000 specimens in June to almost 175,000 in September.

But on Android's side, security experts point out that the closed, proprietary iOS architecture has some drawbacks, such as that when an iOS device is "jailbroken," its security shield is basically broken. Android's inherent openness and flexibility, something missing from iOS, is making it attractive as a platform for organizations considering customization of security the way they want it.

"You can build more security for Android," notes Tom Kellermann, vice president of cybersecurity at Trend Micro, who points out Android's open API model is conducive for that. But he notes that for now, at least, Google Android is also viewed as more vulnerable.

Worries about possibly having to cope with Android malware on either corporate-owned devices or Bring Your Own Device (BYOD) situations seems to be swaying a number of information-technology managers to vote "yes" on iOS, "no" on Android.

At Los Angeles-based real-estate investment firm Hearthstone, for example CTO Robert Meltz says this is one of the main reasons why his company is going with managed BYOD iOS devices.

New York-based Blackstone Group feels much the same, according to CTO Bill Murphy. And in the healthcare environment, such as hospitals where use of tablets and other mobile devices under BYOD arrangements is surging, the same reservations about Android are voiced.

"We tested Android and we think it's more vulnerable than iOS," says Barak Shrefler, the IT and security manager at Hadassah University Hospital in Jerusalem, adding that IT staff are concerned that malware or vulnerability issues around Android will simply result in future headaches, at least more than Apple iOS. At the same time, Shrefler acknowledges he's worried about jailbroken iOS devices, too.

Tamir Hardof, director of product marketing at Juniper, admitting he's reluctant to take sides, nevertheless says "data shows there are more security threats on the Android side." But he adds that Apple's closed system may not be what's preferred for some enterprise customers with specific security requirements, and he's optimistic in general that "security will improve for Android devices."

Tyler Shields, senior security researcher at Veracode, had this to add to the debate: "One of the primary differences between iOS and Android is the application distribution and vetting models. IOS has a single application store, iTunes, that customers can download applications from. While Apple is not perfect, they have executed better than Google in the application vetting process while attempting to limit malware distribution."

Chris Astacio, Websense manager of security research, also weighed in. "In the ongoing discussion of whether iOS or Android devices are more secure, the overwhelming majority of evidence helps to support Apple's case for supremacy," says Astacio. Why? "The iOS closed operating system and application vetting process help prevent a vast majority of the successful malicious examples we have seen in Android devices."

But Astacio also includes something of a caveat.

"Apple's vaunted application-screening process will only maintain its current success until the top-notch hackers feel it is profitable to create malware sophisticated enough to hide from their application-screening process."

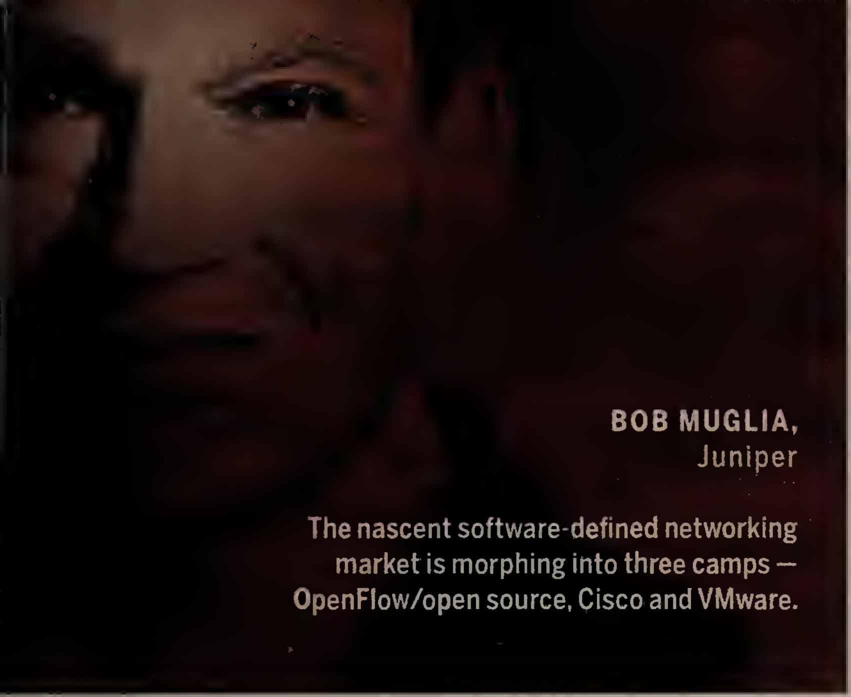
CISCO, VMWARE AND OPENFLOW SDN

Juniper Networks Executive Vice President Bob Muglia spells it out succinctly: The nascent software-defined networking market is morphing into three camps — OpenFlow/open source, Cisco and VMware.

Muglia says Juniper is looking to coalesce the industry around a third "standard" in SDN controllers, one that would be an open source alternative to those offered, or to be offered, from Cisco and VMware. Given their dominant positions in their respective markets, Muglia expects Cisco and VMware to be leading players in SDNs.

"We think the likely thing and the best thing for the industry is to have an open source controller emerge that becomes a third standard controller," Muglia said in an interview with *Network World* in September. "One that is available broadly across companies and supports the broad set of capabilities that are needed."

And that pretty much lays out how the SDN marketplace is shaping up — the Cisco camp, the VMware camp, and everyone else looking for an alternative to Cisco and VMware. That mantle is falling on the open source community, where OpenFlow-based



BOB MUGLIA, Juniper

The nascent software-defined networking market is morphing into three camps — OpenFlow/open source, Cisco and VMware.

controllers have seized the early momentum.

Juniper is supporting an OpenFlow/open source controller from startup Big Switch Networks, which has also garnered the support of many other industry players, including Arista Networks, Broadcom, Brocade, Citrix, Dell, Extreme Networks, F5, Mellanox and Microsoft. Meanwhile, data center titans HP and IBM are offering their own OpenFlow-based controllers.

But Juniper cautions not to read too much into the Big Switch endorsement. The company did not answer a direct question on whether the Big Switch controller and its Floodlight open source core represent the third standard Muglia referred to.

"Juniper's involvement in the Big Switch announcements highlights our commitment to partnerships to support and advance open SDN protocols. This will continue to be a key part of our SDN strategy," says Mike Marcellin, Juniper senior vice president of strategy and marketing.

Cisco, which also offers an OpenFlow-based controller for research and academia, has actually downplayed OpenFlow's significance in programmable networking. Cisco targets five key markets for programmable networks but views OpenFlow as only relevant in one of them — research and academia. And thus far, Cisco has pledged to support OpenFlow on only the Catalyst 3750-X and 3560-X switches.

VMware paid $1.26 billion to acquire startup Nicira for its overlay network virtualization control software. Nicira was co-founded by OpenFlow creator Martin Casado but OpenFlow plays a supporting role in Nicira's software — not a central one.

"Traditionally, OpenFlow does not do network virtualization," Casado told *Network World* in June. "All OpenFlow does is allow you to control switches and it may allow you to run different applications on the switch. But it doesn't provide you the ability to create a virtual network that's topology independent that supports L2 and L3. I don't know of any OpenFlow solution that does this."

Perhaps with the activity around defining an open source standard SDN controller to go up against Cisco and VMware, this gap will be filled.

CATALYST 6500 VS. NEXUS 7000

These days, Cisco network administrators are a nation divided.

It is not enough for the network admin to say he works in a Cisco shop. The admin should also specify a preference of Cisco switch — either the widely used Cisco Catalyst 6500 family of switches or the cutting-edge Cisco Nexus 7000 line.

The debate over Catalyst vs. Nexus frequently flares up on the popular Packet Pushers podcast for network administrators. And both sides of the debate have their fundamental reasons for sticking with their favored gear. Nexus advocates like the speed and the virtualization capabilities. Catalyst adherents appreciate the lower costs and familiarity.

It is hard to tell if Cisco planned to bifurcate its considerable market share for switches. In 2008, the company introduced its Nexus line as the next generation of virtualization-aware switches. The thing is, customers were more or less pleased with, or at least used to, their Catalyst switches, which have long been dominant in the marketplace.

Cisco would be "crazy to kill off," the Catalyst, says Zeus Kerravala, head of the IT research firm ZK Research. Cisco today won't say if it intended Nexus to replace the Catalyst, but the company is still adding features to the Catalyst and hasn't made any noise about discontinuing that line, at least for a while.

So, should you use the Nexus or the Catalyst? Like a response from a non-committal Magic 8-Ball, the answer is, it depends. "This is an issue that my guys in the field face every day, because of the differences in features and philosophies," says Dan Vargas, a solutions architect lead for IT systems provider CDW.

Cisco's own take is, more or less, this: Use the Catalyst switches for the campus — the office environments with worker PCs — and use the Nexus for data centers. "Campus deployments require user access control and segmentation, application intelligence, wired and wireless convergence, while data center environments require SAN and LAN convergence, virtual machine awareness and workload mobility and cloud security," says Shashi Kiran, Cisco director of marketing for data center solutions.

If you have a healthy budget to set up a new data center, the Nexus is indeed the way to go, advises Kerravala. But if you have a Catalyst installed base, then it may be prudent to stick with the Cat. Certainly a sea of network administrators are already familiar with Catalyst's IOS (Internetwork Operating System), a cryptic but ultimately very powerful operating system. With the use of scripts, IOS offers "so much flexibility, there was almost no problem you couldn't solve," Kerravala says.

Independent channel vendor NHR (Network Hardware Resale) tends to default to pitching the Catalyst for most of its customers. "There is a lot of aggregation switching out there that the 6500 is perfect for," says Michael Lodato, NHR senior vice president of sales and marketing.

While praising the Nexus' muscle, Lodato cautions, "If you don't need the Nexus, don't buy the Nexus," he says. "Not all of us are low-latency traders sending traffic from Chicago to New York. A lot of us are just sending email around the office."

Key to picking which switch to deploy is "understanding how it will be used," Vargas says. Many seemingly small factors, such as the operating environment, may influence a decision, he says. Nexus requires a deeper rack than Catalyst, and may require a different form of airflow patterns to keep cool. It also requires a different power supply.

Each switch has a considerable number of features the other doesn't. The Catalyst has a broader feature set, while the Nexus focuses on the high-level cutting edge features such as Layer 2 encryption — a tasty treat for those low-latency traders — and the ability to set up virtual switches.

Vargas advises customers to clear space on a whiteboard and list all their requirements, and then check which features each switch supports. "Once you're done with that, you get a pretty definitive answer," he says. ■

➔ Read all 15 of *Network World*'s hot tech debates online. ***tinyurl.com/d7mwr8g***

Roy Cahn-Speyer

HP PRODUCT MARKETING MANAGER FOR THE AMERICAS, HEWLETT-PACKARD CO.

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Can you explain how iLO 4 delivers a smarter and more automated server?
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What advice would you offer CIOs looking to future-proof their server infrastructure? When you're counting on a server farm to power your business, you want a smarter server with intelligence close to the application. This will enable you to automate manual operations, lower operating costs and increase uptime. Moving in this direction is a journey. We believe the ProLiant Gen8 server with AMD is an excellent place to start.

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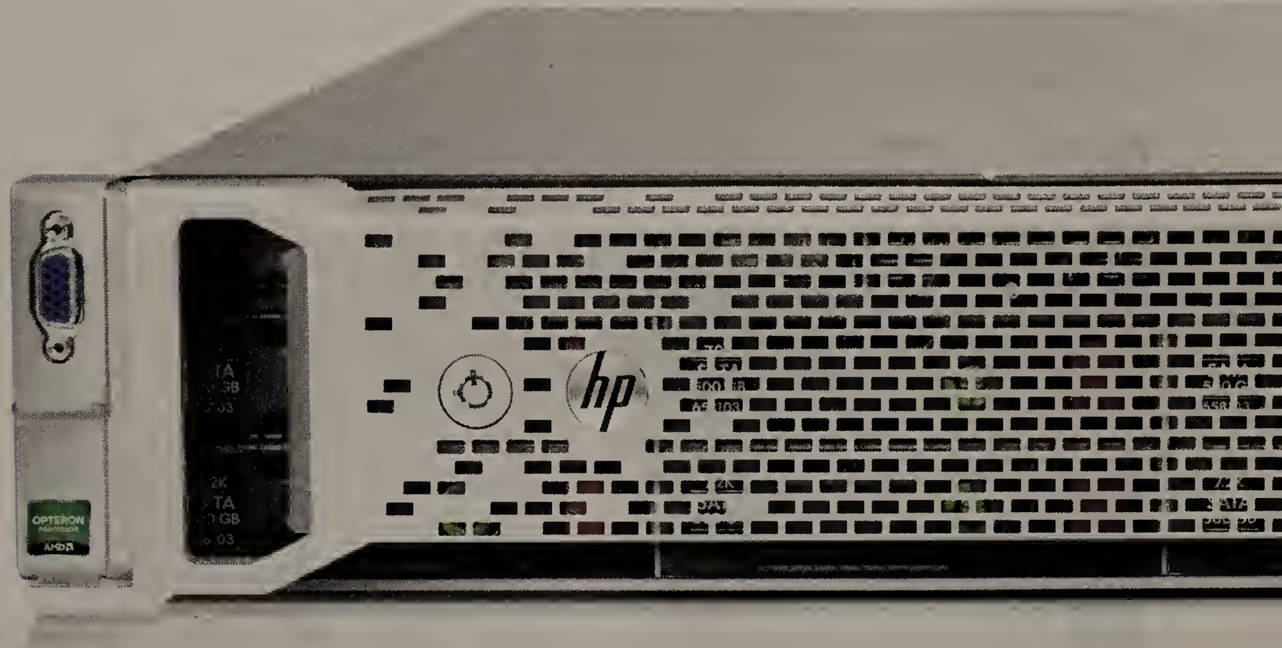

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TOOLS

Vera 3 — poor but promising home automation

Mark Gibbs' Gearhead

I feel like the Grinch. Why? Because I'm massively disappointed in the product I'm reviewing this week, which makes two weeks in a row I've been "bah humbugging" (see last week's excoriation of an Internet thermostat, tinyurl.com/ctzgrxn).

The product in question this week, the Mi Casa Verde Vera 3, is a home automation system based on an operating system called MiOS that is aimed at the general premises automation market.

The Vera is a small box that you plug into your network to provide access and management of switches, sockets, plugs, sensors, and many other devices that can be interfaced to by Z-Wave, Insteon, IR, UPnP, TCP/IP and X10 networking systems.

If you've not spent much time looking at these market standards for short-range networking, the variety of devices available is impressive. The old powerline X10 system is the most primitive of the lot offering a best effort, no acknowledgment, level of service while the other technologies provide features such as adaptive mesh networking and status reporting over powerline and or wireless connections.

The Vera aims to not only control devices on any of these network systems simultaneously but also provide complex programming support with plug-ins for data gathering, generating notifications, environmental data integration (weather, time of day and so on) and reporting.

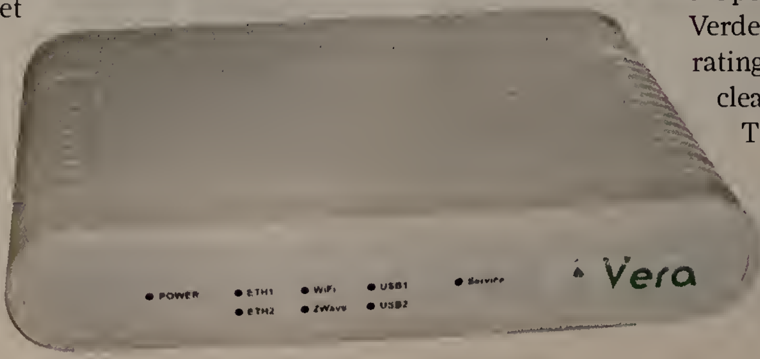
The Vera is, in fact, a fairly sophisticated Linux platform running a version of MiOS which, it is claimed, can also support devices on ZigBee, PLC, serial, 6LoWPAN, BACnet and Wi-Fi Direct networks (these alternatives are not available with the Vera).

My problem with the Vera lies not in its hardware but rather its user interface and, more crucially, the metaphor or rather lack thereof used to configure and manage devices.

My first big problem with the Vera UI is that it's ugly. Really ugly. It uses several graphic styles with a passing nod toward a modern UI design but stops far short of actually being modern and polished. The "clunky feel" is highlighted by everything from the unnecessarily "techie" default names for devices (for example, "_Dimmable Light") to numerous spelling mistakes and poor documentation.

My second big problem is that there's no obvious and easily understood metaphor for automating devices — it took me the better part of an hour to figure out just how to switch on a light and have that event trigger switching off the light 10 seconds later ... it really shouldn't be that obscure.

...it seems a pity that Mi Casa Verde hasn't embraced the huge trend toward using JavaScript or even Perl or PHP.



Normal people would understand the idea of linking events (for example, sundown) or triggers (for example, "hall light switch off") to devices, but instead Mi Casa Verde has created a labyrinthine system of "Scenes" (collections of grouped devices) that encompass "Triggers" and "Schedules" in a non-obvious way.

The Vera system supports a large number of plug-ins written by third parties (most are free) that can be added to the base system, but again, the method of adding them is unnecessarily laborious and the documentation for each one is, at best, poor (at worst it is nonexistent).

To do anything serious with Vera requires programming and here's where Mi Casa Verde goes out on a limb: Vera uses a proprietary programming system the company calls "Luup," which combines Lua (I discussed the Lua language last year — tinyurl.com/c9g5ks3) with Universal Plug and Play (UPnP).

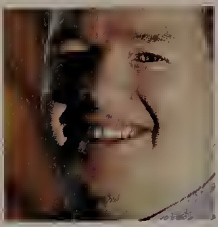
While I'm sure that Luup has its good points it seems a pity that Mi Casa Verde hasn't embraced the huge trend toward using JavaScript or even Perl or PHP. From my scanning of the forums, the Luup language also has more than its fair share of problems.

Alas, I don't have space to slice and dice the Vera 3 in greater depth. The bottom line is that Vera 3 is very promising and, despite its current incarnation as a typical "engineers gone wild" product, it could easily be redesigned to do what users need as simply and elegantly as possible.

So, despite my somewhat harsh review, the potential of this system gets the Mi Casa Verde Vera 3, priced at $299, a Gearhead rating of 3 out of 5. If you're an end user, stay clear. If you're a geek, it's Christmas and Thanksgiving rolled into one. ■

Gibbs has mixed feelings in Ventura, Calif. Automate your response to gearhead@gibbs.com and follow him on Twitter (@quistuipater).

Collaborating and videoconferencing over the cloud with OmniJoin



Keith Shaw's Cool Tools

THE SCOOP

OmniJoin Web/video-conferencing

by Brother, starting at $50 per month

▶ **What it is:** The OmniJoin service is a collaboration and Web conferencing platform that provides high-quality videoconferencing features for attendees. At the basic level, up to 30 attendees can join a meeting, with up to 12 video windows to provide face-to-face interaction. The OmniJoin Pro service offers up to 50 attendees and up to 20 video windows during a meeting, and an enterprise version is also available with customized settings for licenses, attendees and video participants.

As with other Web conferencing services (think GoToMeeting, LiveMeeting or WebEx), OmniJoin meeting hosts can share a PowerPoint presentation, an application, a whiteboard, their desktop, hold a chat with attendees and share files. Control of a meeting can be exchanged from hosts to any attendee, providing for remote collaboration (for example, working together on a spreadsheet or other application). Hosts can set up meetings in advance via their OmniJoin client application, or through the OmniJoin website, or conduct ad hoc meetings with other contacts in an instant messaging-like fashion.

Meetings can be recorded for attendees that miss a session, with video (MP4 format) being stored locally on hosts' computers (an upcoming version will record and store video through the cloud). For audio, customers can use multipoint, full-duplex VoIP via the service, or use a traditional telephone audioconference option.

While the video can be handled by any standard webcam found on attendees' computers (or external USB webcams), Brother also makes its own hardware — the company's NW-1000 HD Videocam ($100) provides full 1080p or 720p video, a built-in stereo microphone and plug-and-play connectivity via USB 2.0 port. The company also makes a Compact Speakerphone (model VT-1000, $100), which enables mobile users to convert their smartphones into higher-quality speakerphones. The hardware isn't required to use with OmniJoin, but both devices fully support the service.

▶ **Why it's cool:** The service utilizes cloud technology to provide videoconferencing servers that clients connect to, rather than set up peer-to-peer connections between attendees. The cloud technology, along with additional parallel processing and multimedia processor extensions, aims to improve video quality for everyone in a meeting room. The system uses dynamic scalable video (MPEG-4 variable bitrate encoding) that gives HD quality to users who have enough bandwidth, but then scales down on a per-connection basis to clients with lower bandwidth (more details at tinyurl.com/c2nnjew).

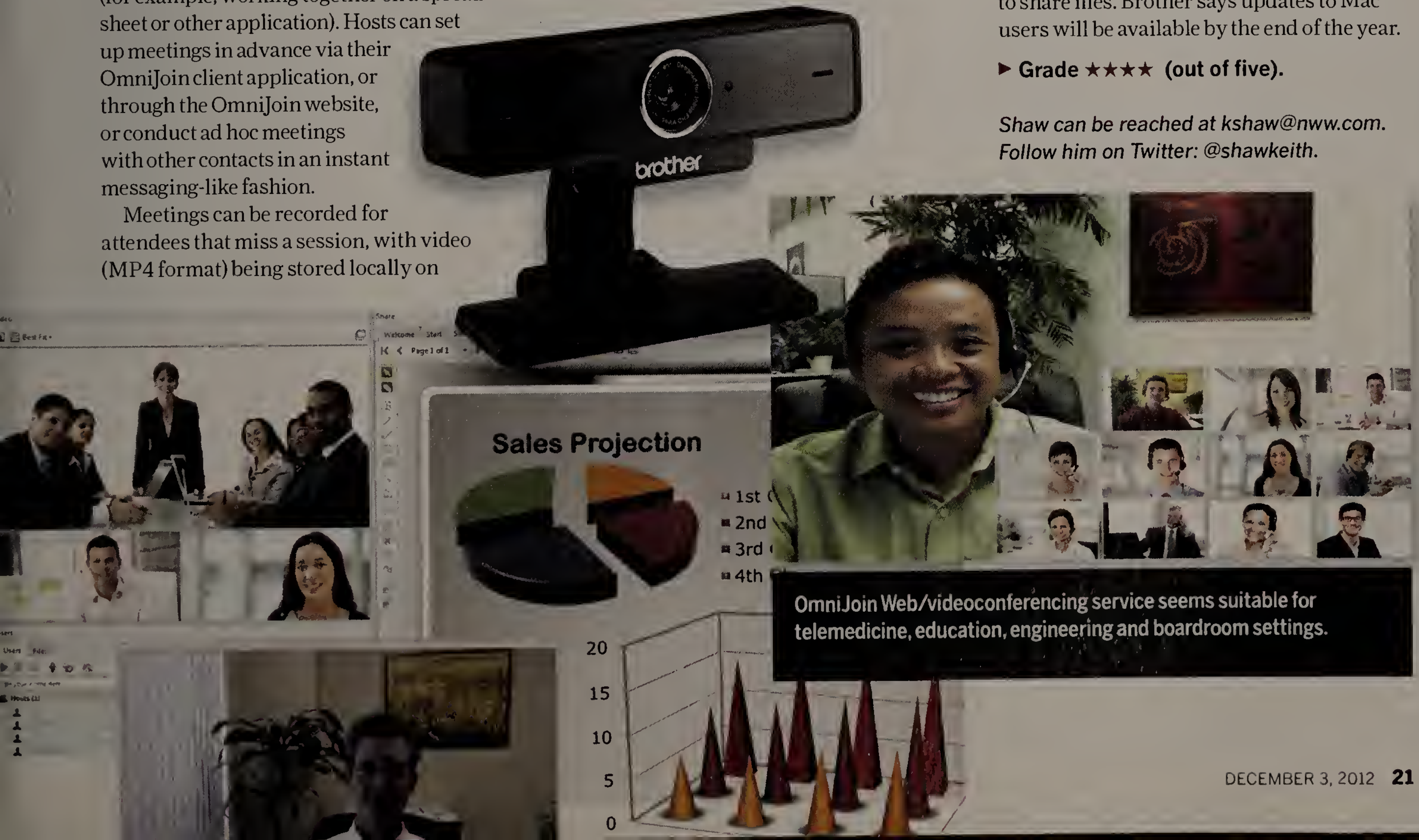
The collaboration tools are quite nice and easy to use — the user interface is easy to navigate for hosts and attendees. The service offers multiple layouts for video windows and application sharing — if meeting hosts want to just have a large video chat without any application sharing or presentations, they can make video windows larger, for example.

The service seems quite nice for disperse groups of employees that need to work together on projects — OmniJoin seems quite suitable for telemedicine, education, engineering and even boardroom settings.

▶ **Some caveats:** There are some issues with Macintosh clients in the ability to see videos played from a host (the host was using a Windows video player and I couldn't see it play on my Mac) as well as the ability to share files. Brother says updates to Mac users will be available by the end of the year.

▶ **Grade ★★★★ (out of five).**

Shaw can be reached at kshaw@nww.com. Follow him on Twitter: @shawkeith.



OmniJoin Web/videoconferencing service seems suitable for telemedicine, education, engineering and boardroom settings.

ECS ISSUE

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ecs

ENTERPRISE
CLOUD
SERVICES

2013
YEAR OF THE HYBRID CLOUD

Hybrid clouds, cloud brokers, big data, software-defined networking (SDN) predicted to be the major trends in cloud computing in 2013.

BY CHRISTINE BURNS

The time for dabbling in cloud computing is over, say industry analysts. 2013 is the year that companies need to implement a hybrid cloud strategy that puts select workloads in the public cloud and keeps others in-house.

"Next year has to be the year that enterprises get serious about having real cloud operations as part and parcel of their IT operations," says John Treadway, vice president at Cloud Technology Partners, a consultancy.

Treadway says that in the last year, he and his colleagues have worked with many large enterprise clients who have implemented half-baked, haphazard cloud infrastructure schemes — most of them private and developed in-house.

They have some virtualization, explains Treadway. And they may even have some automation. "But when you peel back the onion you can't find the type of cloud infrastructure where you can request a resource and have it provisioned automatically on the fly. There is still a lot of human labor involved in those processes," Treadway says.

He expects most of these in-house private clouds to be abandoned in favor of more strategic hybrid mixes of public cloud services and more commercially packaged private clouds services like those based on the OpenStack standard or VMware's vCloud.

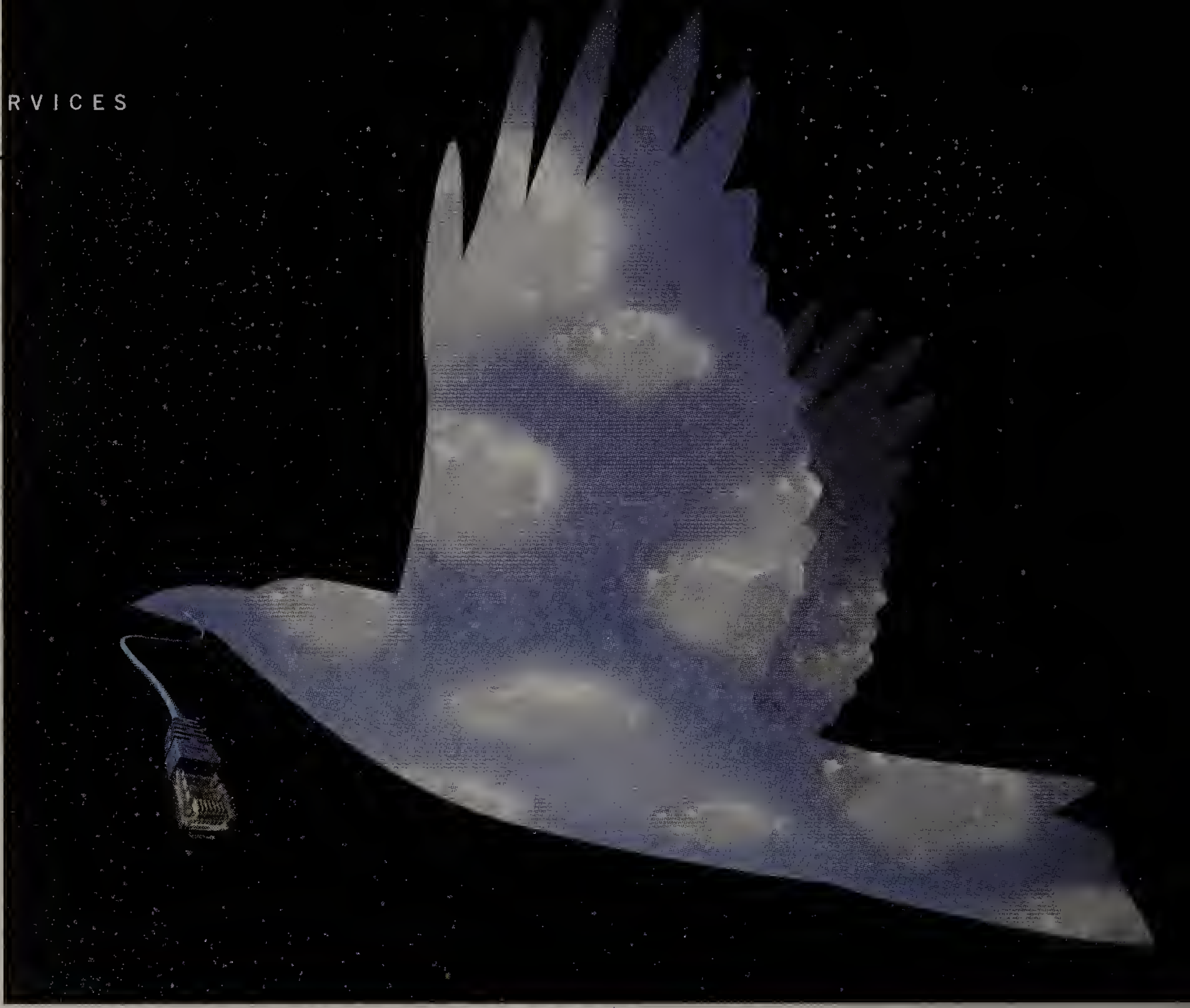
PREDICTION 1

Hybrid clouds will take off

"I'm convinced 2013 is going to be the year of the hybrid cloud infrastructure," says Tracy Corbo, principal research analyst at Enterprise Management Associates.

"Cloud infrastructure outages happen. That's a fact that is not going to change. So it only makes sense for an enterprise to take a look at the workloads they can put in the public cloud where there lies the bigger risk of outage and data loss and those that should be placed on a more controlled private cloud," Corbo says.

COVER AND INSIDE PHOTO ILLUSTRATIONS: STEPHEN SAUER



That hybrid infrastructure as a service (IaaS) split is likely to be divided between the systems of engagement (customer service systems, for example) and the systems of record (like back-end financials), explains Chandar Pattabhiram, former marketing executive at Cast Iron, a cloud integration company purchased by IBM, and currently vice president of marketing at Badgeville, a company specializing in gamifying cloud applications.

Hybrid cloud deployment is not a new concept. Research published by Gartner shows that the hype surrounding hybrid cloud reached its peak last summer. According to Gartner's research scheme, early adopters take on a technology at the peak of the hype cycle, then there's a period of disillusionment when stories of early adoption failures come out. That's followed by a slow adoption phase, when vendors begin delivering on second- and third-generation services. Finally, there's the phase where adoption becomes mainstream.

Amazon is still the uncontested leader in the public IaaS cloud space, with expectations that it will continue to pull down more than $2 billion annually in that market. But vendors with long and strong ties to the enterprise are all rolling out public offerings alongside their private cloud services.

For example, HP jumped into the public cloud market last summer when it rolled out its OpenStack-based HP Cloud Services. According to Dan Baigent, senior director of business development for HP Cloud Services, there is certainly a "pent-up" need for public IaaS. "We expect to see the most interesting growth patterns in that space," he says, arguing that HP's long-standing relationship with enterprise customers will help it make inroads there. It's difficult for enterprises to support multiple clouds from different vendors, Baigent says, and getting both parts of the hybrid cloud from the same provider can simplify that prospect.

Treadway argues that many public cloud vendors will go under. "It's very hard to play in the Amazon game. The margins are small and if you don't offer a differentiating value, you are very likely going to fail," Treadway says.

Lydia Leong, research vice president at Gartner, agrees that 2013 will see some corrections to the public cloud market, pointing to Web hosting vendor GoDaddy quietly closing the doors on its public cloud operation in October as a prime example. "These closures certainly don't give any kind of signal that cloud computing is a failure. They simply demonstrate that it doesn't make sense for every vendor to compete in that market," she says.

PREDICTION 2

Hybrid-cloud management becomes key

If hybrid clouds are the deployment of choice, EMA's Corbo says the IT industry has to make significant inroads on how to manage that type of environment in terms of resource provisioning, scalability and performance.

"It's unfortunate that the IT industry seems to build infrastructure, and managing it is always an afterthought," Corbo says.

IDC issued a report in August that said the worldwide cloud systems management software market grew dramatically, totaling an estimated $754 million in 2011, an increase of 84.4% over 2010. The top two vendors, CA Technologies and VMware, benefited from market demand for a range of capabilities beyond self-service provisioning.

These include automated infrastructure orchestration and virtualization management used to enable dynamic infrastructure resource pooling and sharing across multiple workloads and user groups, and the ability to track cloud resource consumption to support life-cycle management, capacity planning and chargeback.

IDC listed the other top players in that market — determined by revenue — as HP, IBM and BMC. That said, more than 63% of the revenue these companies raked in came from sales to companies managing private clouds only.

IDC expects most successful cloud systems management software vendors will offer customers a wide range of capabilities beyond self-service portals and automation and will be architected to support heterogeneous hypervisor and hardware platforms, as well as a range of hybrid cloud scenarios.

RightScale, a company that bucks Corbo's assertion that management is an afterthought, has offered a service since 2006 that integrates with multiple clouds and allows users to view federated cloud deployments from a single dashboard. The company boasts of a 4.7 million customer base supporting a variety of public and private cloud platforms, including Amazon Web Services, Windows Azure, Google Compute Engine, Datapipe, HP, Logicworks, SoftLayer and Tata. On the private cloud side, RightScale can be used to manage workloads on the OpenStack, CloudStack and Eucalyptus platforms, all of which are open source.

Other startups that have jumped into this space include Cohuman, Okta, Scalr and Tier 3.

Brian Donaghy, CEO of Appcore, a cloud services company in Des Moines, Iowa, that offers a portfolio of private, public and hybrid services, says that developing the skills to manage a multi-cloud environment will make IT professionals a hot commodity in the next year as well.

PREDICTION 3

Cloud brokerages & integration hubs will explode

Early adopters of the cloud tended to take on the technology when they were building singularly focused greenfield applications. "So the issues associated with integrating either legacy systems or other cloud-based application was not so urgent," says Martin Capurro, a product manager at Savvis Direct, a public cloud service offered by national telco CenturyLink. "They are now."

IDC predicts that by 2015, nearly $1 of every $6 spent on packaged software, and $1 of every $5 spent on applications, will be consumed via the software as a service (SaaS) model. As enterprises buy more and more of their applications as SaaS, issues of integrating the applications themselves, developing security and auditing processes across them, and figuring out how to create B2B links with partners using the same applications will all need to be addressed.

Cloud service brokerage (CSB) schemes set up by cloud providers themselves seek to address the first problem while systems integration services and integration hubs seek to address the latter two.

"CSB" was the phrase for cloud arbitrage that Gartner coined in 2009. More recently, NIST has defined this category of service providers as "an entity that manages the use, performance and delivery of cloud services and negotiates relationships between cloud providers and cloud consumers."

Practically speaking, CSBs are the middlemen that aggregate SaaS applications in the cloud and supply a portal by which its customers can buy, access and somewhat control the use of multiple multi-tenant cloud applications within their own companies. The broker negotiates a good price that is passed on to the customer, provides a single point for end users to sign onto these applications and presents the IT department with one monthly bill.

According to Treadway, integration hubs — defined as single integration points between multiple cloud applications — are much needed today, but are more difficult to pull off than CSBs. That's because many custom-built cloud applications are not built using standard APIs, which means that linking them to any other application requires a spaghetti network of connections that is nearly impossible to maintain, says Treadway. The problem is further exacerbated by the proliferation of devices most cloud applications are now required to support.

Almost every major player in the IT space that bases a big chunk of its business on integration has a play in this market, as well. Startups include Cordys and Informatica.

"The advice I give clients is to make sure they have a comprehensive integration strategy developed upfront, and only build or buy applications that have standard APIs and were built within a service-oriented architecture," says Treadway.

PREDICTION 4

Big data analytic tools will get better

Big data — the voluminous amount of unstructured or semi-structured data a company creates for which it is cost prohibitive to load into a relational database for analysis — just gets bigger and bigger in the cloud and businesses are realizing they can't afford to ignore that fact.

Using very geeky predictive modeling and data mining principles, big data analytics tools let users digest volumes of transactional data and other streams like those collected from Web server logs, social media reports and mobile-phone call records that have not previously been tapped by business intelligence tools.

"What they want is actionable analytic big data tools that give them the right information to make business decisions in real time," Treadway says. But innovation in this space, he says, is random at best.

According to CB Insights, a consultancy that tracks venture capital activities, analytics companies have taken the majority of $1.1 billion in big data venture capital funding deals on record since the second quarter of 2011. These analytics companies include those offering real-time data, such as Metamarkets, and others offering analytics solutions, such as Datameer.

But established companies are also investing in this area. Take HP's acquisitions of both Vertica (a data analytics firm bought in February 2011 for an undisclosed amount) and Autonomy (a U.K.-based information management software firm bought in August 2011 for $10.3 billion). Prior to HP's spree, IBM and EMC had already bought big data analytics databases, scooping up Netezza and Greenplum, respectively.

"It's invaluable to our customers to be able to have the ability to put a wrapper of knowledge around the hordes of data coming into a company through its cloud deployments," HP's Baigent says.

PREDICTION 5

'SDN' will be just 'networking'

The idea of software-defined networking rocked the networking world in 2012.

Inside the SDN scheme, the control plane gets decoupled from the data plane in network switches and routers. The control plane runs as software on servers and the data plane is implemented in commodity network equipment.

In July, cloud server software giant VMware plunked down $1.05 billion in cash and another $210 million in assumed unvested equity for Nicira, an SDN startup that had lured high-profile talent away from both Juniper and Cisco.

Cisco's initial reaction to the prospect of SDN was called Cisco Open Network Environment (Cisco ONE), which is a architectural scheme designed to enable Cisco networks to be flexible and customizable to meet the needs of newer networking and IT trends such as cloud, mobility, social networking and video. And then Cisco made some announcements with the OpenStack community in support of its open source SDN projects, and in November, the company agreed to pay $1.2 billion in cash to acquire Meraki, a San Francisco-based provider of networking systems that can be managed from the cloud.

"All of these moves just point to the eventual realization that software-defined networking is just going to collapse back into a new definition of networking that is going to evolve in 2013," says Terremark CTO John Considine.

PREDICTION 6

Gamification will drive sales and customer services

Gartner predicts that by 2014, 70% of all Fortune 2000 companies will have at least one cloud-based application that employs game theory to influence employee or customer behavior. According to Badgeville's Pattabhiram, many of them already do, and next year will simply be the year that people sit up and take notice of how effective these applications are in driving business opportunity.

Gamification is the concept of applying the psychology of game-design thinking to non-game applications to make them more fun, engaging and addicting. The psychological carrots include the need for public recognition and the thrill of competition. The applications in the business world include boosting sales, encouraging collaboration and information sharing among employees and partners, and increasing customer service satisfaction.

There are more than 50 gamification products, platforms and services available on the market including Badgeville, BunchBall, Crowd Factory, Gamify.it, Hoopla, Kudos, Objective Logistics and Rypple (a Salesforce.com company), to name only a few.

Pattabhiram contends that the potential benefits of gamification to the enterprise, should it be implemented next year, are behavior management, rewarding participation, controlled social mechanics and behavior analytics.

PREDICTION 7

Hybrid security will bloom

IDC security analyst Phil Hochmuth has no doubt that there will be security breaches in the cloud next year, whether we get wind of them or not, mainly because of the fact that using hard-to-control mobile devices is the dominant means by which employees are accessing the cloud.

"That is one of the biggest reasons we are seeing most vendors take on a hybrid delivery model for their security products," Hochmuth says. Under this scheme, security vendors are offering — and enterprises are deploying — the traditional appliance-based security products for on-premise access and then enlisting a SaaS product — most of the time from the same vendor to help facilitate unified security management policies — to shore up secure access from mobile clients. IDC predicts that over the next three years, hybrid deployments will comprise 60% of all deployments, a market the firm says will balloon to $3.3 billion by 2016.

PREDICTION 8

Data sovereignty issues will multiply

Controversy about the jurisdiction and legality of data stored in the cloud and outside of a customer's home country will erupt as cloud adoption grows in 2013, says Jim Reavis, executive director of the Cloud Security Alliance.

But don't expect government policy changes to help mitigate the problem, Reavis says. Greater customer awareness of data residency options, such as format-preserving encryption, will address these concerns and technological innovation will do more to solve this global policy question than will government action.

PREDICTION 9

IaaS-based services will expand

EMA's Corbo predicts there will be an increase in services delivered as part of standard IaaS offerings.

"You will see IT folks thinking hard and long about what other infrastructure services can be off-loaded into the cloud," Corbo says. Specifically, she expects to see growth in the areas of WAN optimization (a service is already offered by a startup called Aryaka and mainstays such as Cisco and Akamai have made some movement in this direction) and load balancing as a service in the cloud (Amazon and Rackspace both offer these services).

"It's not a question of being able to do this stuff in-house. It's a matter of figuring out if it's cheaper and more efficient to do it in the cloud," Corbo says.

PREDICTION 10

Prepare for more outages & shakeouts

Corbo and Gartner's Leong were in sync on their prediction that if customers are asking the public cloud infrastructures to take on more and more responsibilities, then they should be prepared to accept more downtime as well.

"Outages will happen as a matter of course," Leong says. "It can't really be helped when you take into consideration all of the permutations of all the services riding on these infrastructures. There is no way every contingency can be tested for."

Reavis warns that customers should be prepared for other kinds of failures in the cloud in 2013 as well: business failures.

Since we are in a natural part of the entrepreneurial business cycle for cloud, we can expect to see several cloud startups get acquired, change their business focus or go out of business entirely, Reavis says.

"These shakeouts will have differing consequences impacting the availability of customer data and information systems. Customers need to make sure they are mitigating these risks through a combination of building redundancy in cloud security architectures and performing due diligence in cloud business relationships," he says. ■

Burns is a freelance writer. She can be reached at cburns1227@gmail.com.

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OPEN SOURCE DATABASES

Six free databases for the enterprise

MariaDB, Microsoft SQL Server Express, Oracle MySQL are top performers

BY SUSAN PERSCHKE

Free or open source databases run hundreds of millions of public-facing and private applications worldwide, but how effective is this technology and how do these products compare? For answers, we reviewed six popular free or open source database products: Microsoft SQL Server Express, PostgreSQL, Oracle's MySQL, MariaDB, Apache Derby and Firebird SQL.

We chose fully featured relational database management system (RDBMS) products with features such as procedures, functions, triggers and cursors. While we did not perform scientific benchmarking, we did test large tables. For the test data, we used a truncated log file from one of our Web servers containing a million-plus records. The same test data was used across all six products. We ran standard tests such as bulk inserts/imports and performed data manipulation tasks via SELECT, UPDATE AND DELETE statements.

For our test environment we used 64-bit Dell rack servers running Windows Server 2008 R2. With the exception of MS SQL Server Express, all database products we tested are cross-platform capable.

The runners-up in our review are Microsoft SQL Server Express and Oracle's MySQL. From a GUI standpoint, SQL Server offers the best tools and the ability to upgrade to commercial editions should you need additional features and firepower. The migration argument also applies to MySQL, as Oracle now offers a variety of commercial editions of MySQL. The top spot eluded MySQL for a couple of reasons; one is the lack of any useful native management tool. Second, although Oracle keeps assuring developers that it will support the core community edition of MySQL on an ongoing basis, Oracle has already started reserving certain features for its commercial versions.

CLEAR CHOICE TEST

Which brings us to our top choice, MariaDB, an open source product developed by essentially the same original team that developed MySQL before it was acquired by Sun, then Oracle. MariaDB can go everywhere MySQL can go, and when Oracle adds new closed source features to MySQL, MariaDB concomitantly adds some of the same features as open source. And we found MariaDB to perform just a notch better than all the others.

Rounding out our score card is PostgreSQL, Firebird and Apache Derby, in that order. Here are the individual reviews.

Microsoft SQL Server Express 2012

SQL Server Express is a free version of Microsoft's flagship database, SQL Server. Targeted at smaller-scale and embedded applications, Microsoft SQL Server Express is a feature-rich product that provides many of the core features of the commercial version with some limitations on scalability.

Specifically, these include limits on CPUs (one socket with max four cores), memory (1GB utilized, server can have more installed) and size of database (10GB). Of the six products we tested, this is the only one with any meaningful limits, although for many small to midsize organizations this should not be an issue.

The installer for SQL Server Express presents an installation center from where you can read the release notes, run tools to make sure your server has the prerequisites installed and install the actual server, either by running an upgrade wizard or performing a fresh install.

For this review we chose the latter. SQL Server installations are notoriously time-consuming and SQL Server Express is no exception. There are several choices to be made during the install such as which security model to use (we selected mixed SQL and Windows mode).

The SQL Server Management Studio is a comprehensive management interface that provides administrators and programmers tools to manage servers and databases as well as develop database business intelligence (BI). For developers, it can also be integrated with other tools such as Visual Studio and SQL Server Developer Studio.

Inserting a million-plus records took just over one minute and, for comparison, the same data inserted on a standard version of SQL Server took about 45 seconds. Retrieving the first 100,000 records took 10 seconds using SQL Server Express and three seconds on the standard version. However, when we were working with smaller datasets we found the Express version performing nearly as well as the Standard version. For instance, updating a single record took only fractions of a second longer with Express as compared to Standard using our million-row test table.

Security features include basic auditing and user-defined roles controlling access to data and objects. Support for SQL Server Express is available through the Microsoft Developer Network and a variety of online support forums and blogs.

While SQL Server Express may not have all the features — such as high availability and clustering — of its commercial siblings, it is a mature and solid database server that will deliver and perform well for a large percentage of database applications. For admins who prefer a GUI to manage their database, they're going to be hard-pressed to find a better management interface than the one offered

NETRESULTS

Product	SQL Server Express	PostgreSQL	MySQL	MariaDB
Pros	Excellent management tools, migration path to commercial offerings	Cross-platform capable, performance, management tools available with core install	Cross-platform capable, performance, large installed base, commercial versions and support available	Performance, Cross-platform capable, independent, drop-in 100% compatible replacement for MySQL
Cons	Large footprint, some limits in Express version, not cross-platform capable	Some counterintuitive syntax; slightly lagging in performance	Some features reserved for commercial version only, no built-in management tools	No built-in management tools

by Microsoft, the only one we found that came close was the pgAdmin from PostgreSQL.

MariaDB

MariaDB is essentially a binary drop replacement for MySQL created by the same developer as MySQL, Michael Widenius. With some uncertainty about the future of MySQL, now that it is owned by Oracle, there is a large group of community developers who would like to maintain an open source version with all features. The extent of the compatibility is such that MariaDB does monthly merges with the MySQL code base to make sure any features and bug fixes Oracle puts out are added to the latest version of MariaDB and vice versa. MariaDB is published under the GNU public license, and we installed Version 5.5 on Windows Server 2008 R2.

We used HeidiSQL 7.0 front-end client to connect to MariaDB. This gives you a user interface from which you can perform a variety of tasks, such as create new databases, tables and views, as well as import/export data in several formats. After setting up our test database and table we loaded our million-plus rows from a CSV file using the low-priority setting and the data was inserted in less than a minute. MariaDB returned the first 100,000 rows in less than two seconds when using a select statement. As expected, when working with smaller subsets of data we found performance well within the acceptable range. We were able to delete and update statements on single rows in fractions of a second.

Overall, we found MariaDB performance to be a notch faster than MySQL when working with individual rows (selects, deletes and updates).

As with MySQL, security in MariaDB is managed through Access Control Lists for access to all objects and operations. In addition, it includes several encryption functions that can be used for data storage and retrieval, along with SSL for encrypted communication between client and server.

Apache Derby	Firebird SQL
Cross-platform capable, small footprint, can be both embedded and run as traditional client/server	Cross-platform capable, easy to install
Lacking native management tools, some syntax issues	Performance, scalability

As for support, we found the MariaDB website responsive to most questions. There are also several online forums dedicated to MariaDB along with commercial support and consulting available from Monty Program.

There is a lot to like with MariaDB; in particular we appreciate that the company includes in its open source version many of the closed source features of the MySQL commercial edition. One of these features is subqueries, which did essentially not work well in MySQL, and MariaDB finally resolved this. Also, when a major security hole was found in MySQL/MariaDB earlier this year, the MariaDB community found a solution and notified the community.

MySQL

MySQL is one of the most popular open source databases. It is included as part of a variety of LAMP (Linux, Apache, MySQL, PHP) stacks, and large organizations such as Wikipedia, Twitter and Facebook use MySQL. MySQL was originally developed in Sweden in the mid-'90s, was then sold to Sun in 2008, and has been owned by Oracle since it acquired Sun in 2010.

There has been a lot of speculation as to what Oracle's intentions are with regards to MySQL. According to the latest indications from Oracle, it is committed to supporting and updating the core functionality of the community edition of MySQL for the foreseeable future. This obviously makes sense to Oracle considering the vast current installed base, as it gives the company a unique position to upsell several of its commercial offerings such as Oracle Linux, Oracle VM and of course its commercial versions of Oracle MySQL. However, the question still remains as to how many new features will be included in the core open source version and how many will be reserved for the commercial offering.

That being said, since acquiring Sun, Oracle has made several improvements in the way MySQL runs on Windows, and it is now truly a cross-platform database. We installed the community edition, Version 5.5.8, on Windows Server 2008 R2 as part of a WAMP installation. We decided to use both phpMyAdmin and HeidiSQL to manage our MySQL installation. There are also commercial management tools available such as the MySQL Enterprise Edition.

After importing our test data we ran through our basic tests and found most of them perform very similar to MariaDB, as expected. While working with individual rows, we found MySQL to be slightly slower than MariaDB, even if the table, data, indexes and hardware were the same. Oracle has just announced the release candidate for Version 5.6 and this is supposed to have an improved optimizer and other updates that will improve performance. It should be noted that the differences were in the hundredths of a second range.

MySQL security is managed through Access Control Lists for access to all objects and operations. It also supports SSL for encrypted communication between client and server together with data encryption functions that can be used to store and retrieve encrypted data. Support and documentation for MySQL is readily available from Oracle (both free and paid) and from a variety of third-party sources on the Web.

It is hard to not like MySQL based on its ease of use, performance and sheer ubiquity. According to Oracle, nine out of the top 10 websites in the world (we assume as measured by traffic) use some form of a MySQL database. Many of the commercial hosting services offering LAMP and WAMP stacks have built excellent Web front-ends to MySQL, making it easy to manage as part of a Web solution.

PostgreSQL

PostgreSQL has its roots in the Ingres project at UC Berkeley in the 1980s and the first version of PostgreSQL was released in 1995. It is open source and released under the PostgreSQL license. PostgreSQL is essentially an RDBMS, but with an object-oriented database model (ORDBMS).

We installed PostgreSQL Version 9.2 on Windows Server 2008 R2. The installation is very straightforward with only a few options available, such as super user password, listening port and localization. Once the core installation has completed you have the option of launching the Stack Builder that allows you to download and install additional applications, tools and drivers.

PostgreSQL includes a management interface called pgAdmin. Not unlike the MS SQL Server Management Studio, pgAdmin has a robust set of features that is easy and intuitive to navigate. The database and test table with constraints was easy to create. We imported our million-plus rows of test data using the CSV import feature in less than 30 seconds. Retrieving 100,000 rows took less than half a second and working with individual rows yielded good results; selecting, updating and deleting individual rows anywhere in the table took around half a second.

Not quite as fast as MariaDB and MySQL, but certainly better than what we observed with SQL Server Express. One minor annoyance was the need to put field names in quotes if they contained uppercase characters.

PostgreSQL handles authentication through a variety of means from trust authentication, Kerberos to LDAP. Communication between client and server can be encrypted via SSL and the database itself can also be encrypted using the pgCrypto extension.

In addition to extensive documentation and FAQs, PostgreSQL has an active community that offers support to users. Commercial support and hosting is available through companies listed on the PostgreSQL website.

Of the features of PostgreSQL we found the pgAdmin management interface to be one of the biggest pluses. PostgreSQL is a feature-rich database server and it is included in most of the major Linux distributions as an available package. We also found the performance of PostgreSQL to be nearly on par with MariaDB and MySQL.

Apache Derby

Apache Derby is an open source relational database from the Apache project. Written in Java, Apache Derby will run in any Java virtual machine and has a very small footprint (less than 3MB), including an embedded JDBC driver. It is released under the Apache License Version 2.0.

Apache Derby started as Cloudscape in the mid-1990s, then it was acquired by Informix before being re-branded as IBM Cloudscape when IBM took over the assets from Informix. In 2004 IBM contributed the Cloudscape code to the Apache project and in 2005 the first Apache Derby version was released as Version 10.1.1. Apache Derby can be run in two modes, either as a fully functional embedded database engine (for instance as used in Apache Tomcat and Red Hat application server) or as a traditional client-server database using the Derby Network Server.

We installed Version 10.9.1 on a Windows Server 2008 running the Oracle Java Runtime Environment (JRE) Version 1.7. It is important that the JRE is installed prior to installing Apache Derby and the install does require a few commands issued from the DOS prompt. Apache Derby ships with an interactive scripting tool named "ij." It works with the embedded Derby JDBC driver or a client JDBC driver. Using the command prompt we were able to create a test database and empty table from the command prompt using just a few short commands.

After fixing the case problem, the data import took just a few seconds and a select statement to retrieve the first 100,000 records ran in less than five seconds. Just as we observed with the other database servers, working with individual rows of data proved to be quite efficient and our select, update and delete statements completed in fractions of a second. Although Apache Derby did not deliver quite the same speed as MariaDB and MySQL in our tests, but the differences were small, ranging from one-tenth to one-hundredth of a second slower.

Security features include user authentication and authorization allowing for object-level access restrictions. Apache Derby databases can also be encrypted either when they are created or encryption can be added to existing databases.

The small footprint of Apache Derby makes it an excellent choice for embedding in Java applications such as those running on PDAs or cellphones. The Apache website provides comprehensive and current documentation and there is also a fairly active community of blogs and forums dedicated in whole or in part to Apache Derby.

Firebird

Firebird has been in existence in some form or another since 1981 and is currently based on the highly regarded InterBase code released by Borland in 2000. The current modules are released under the Initial Developer's Public License. Firebird runs on Linux, Unix and Windows. We reviewed the latest stable release, Version 2.5.1, on a Windows Server 2008 R2. Installation is very straightforward and completed in a few minutes with few options to decide during installation. In addition we decided to install FlameRobin, a cross-platform management tool for Firebird.

FlameRobin is not as feature-rich as a pgAdmin, SQL Server Management Studio or HeidiSQL, but it does offer some basic features such as the ability to create databases, tables and other objects. Objects are created by providing sample T-SQL code as opposed to providing an interface where you can type in field names and such. However, once you have created an object such as a table, it can be edited using a GUI. As it turned out, the more we worked with FlameRobin, the more useful features we happened upon.

After completing the installation, we created a test database with a table to hold the test data. As there is no real bulk insert option nor an import feature, we ended up creating a "temporary" table to hold the external data and used this to insert into our real table. This process was not exactly elegant, but it did get the job done after some back-and-forth with permissions issues. As is often the case with free and open source software, the documentation is not always up-to-date or presented as well as with commercial software, but a well-formulated search engine phrase eventually yields results for most tasks.

Once the test data was loaded, we conducted our usual test, but ran into problems when attempting to select large numbers of rows (100,000-plus) using SELECT statements both from the Firebird ISQL tool and also using FlameRobin. The ISQL tool simply crashed whereas FlameRobin did return the records, but since these were returned just a few hundred at a time it was hard to get a feel for performance. While working with smaller subsets we found Firebird to work efficiently and we were able to select, update and delete single rows in fractions of a second.

Some of the security features of Firebird include object-level access control and the ability to remove source code for triggers, procedures and views. Firebird does not currently offer native encryption, but there are third-party tools that do. As for documentation, Firebird has an excellent FAQ website along with a variety of other documentation available on the Firebird website.

Overall we were impressed with Firebird SQL as the vendor has added additional features to an already excellent database, InterBase. For example, the most recent releases of Firebird SQL include recursive queries, procedural triggers to remote DB access and multi-threading. A new major release, Version 3.0, is in the works, with an alpha release expected to be available later this year. This will include features such as the ability to write stored procedures in Java and C++.

Conclusion

Bottom line, all the products we reviewed are very capable database servers and selecting one will depend on a variety of factors such as existing infrastructure and scripting language, size of the data to be stored/retrieved, whether the database is to be embedded, and how much vendor support is needed. Once you've selected a candidate, be sure to follow the best practices recommended by the vendor to secure the product, together with the host OS, before it is used in a production environment. ■

Perschke is CSO for Arc Seven Technology. She is also an experienced technical writer, and has written numerous white papers for a number of organizations, including Fortune 500 companies. Susan can be reached at susan@arcseven.com.

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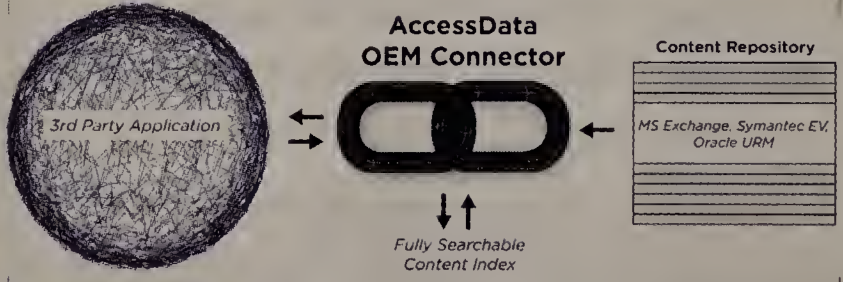

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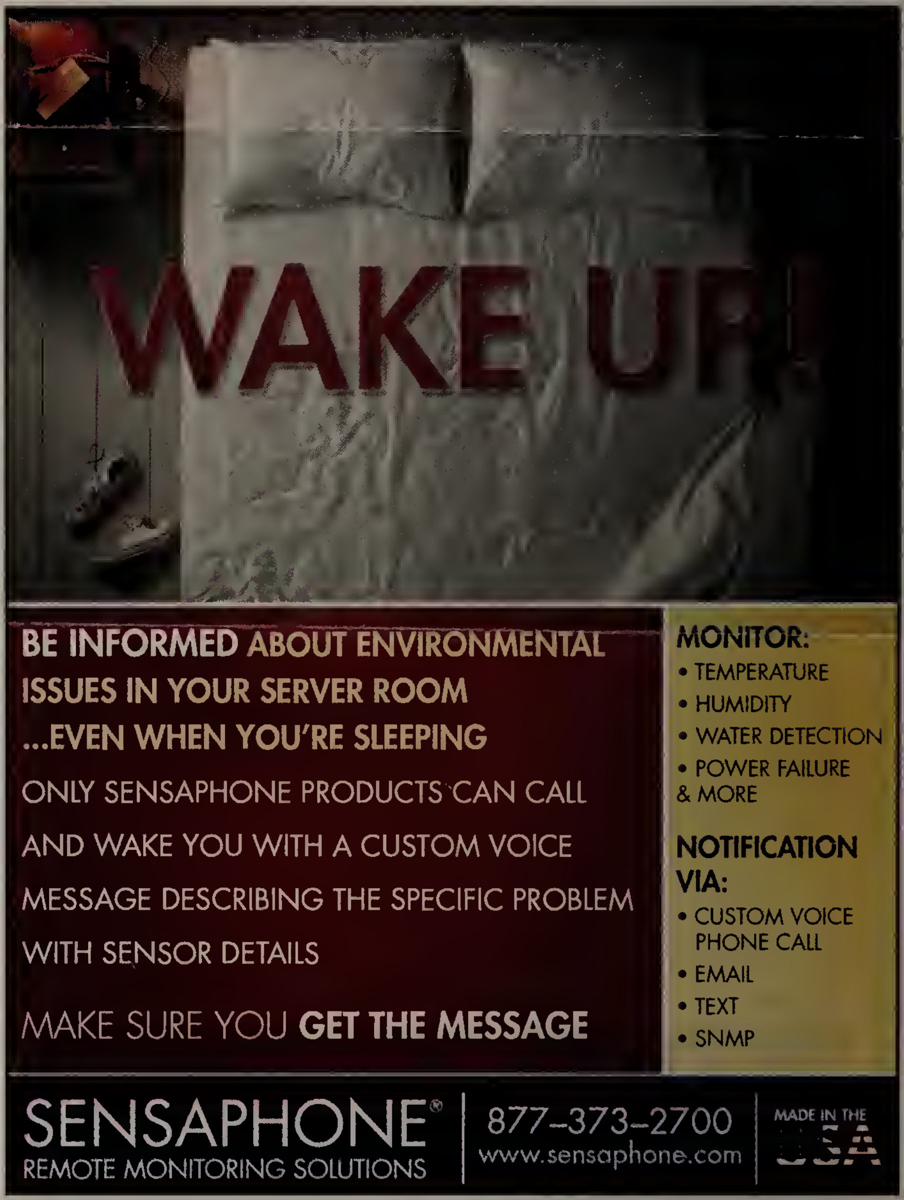

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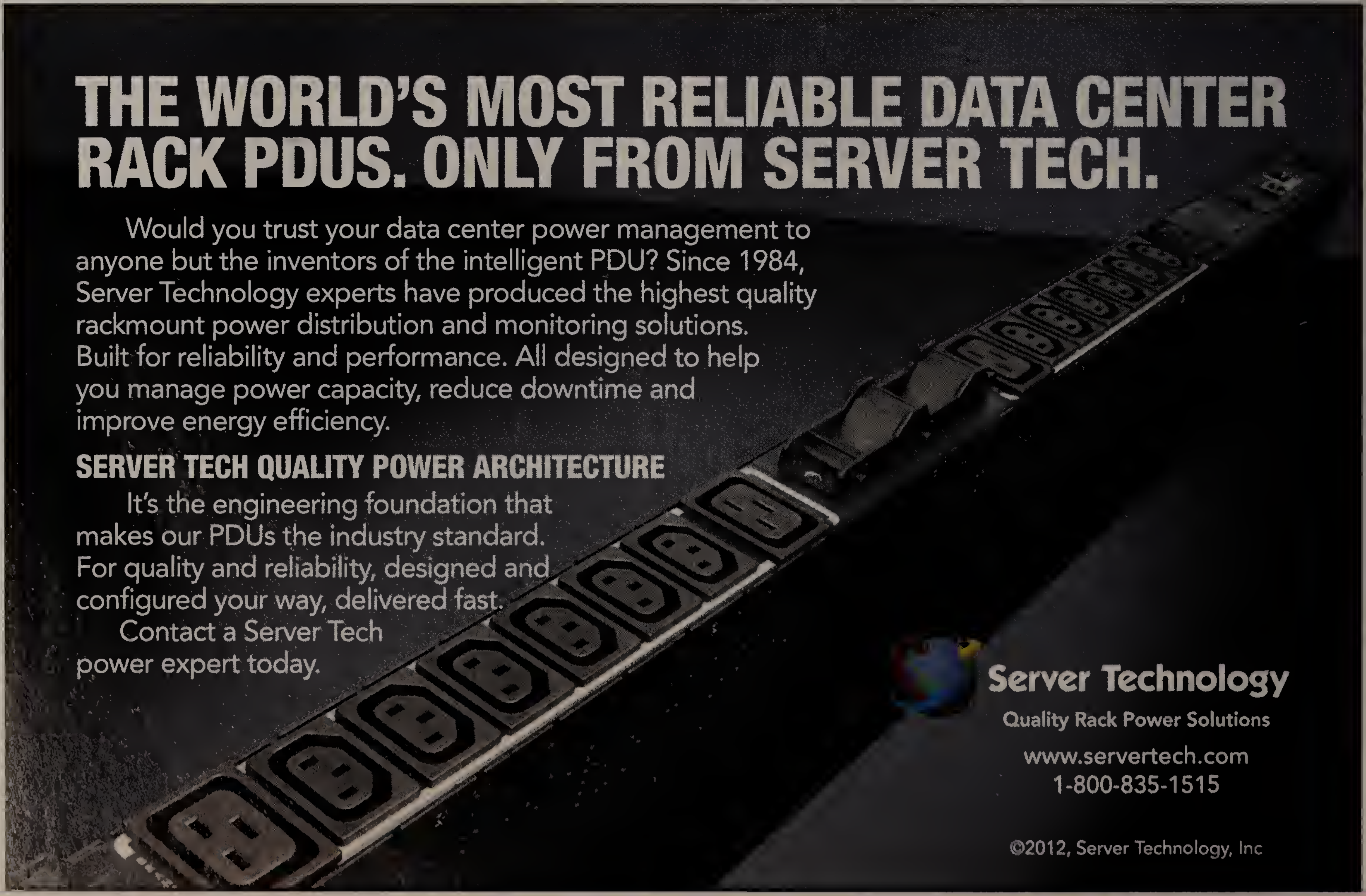

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BACKSPIN | BY MARK GIBBS

The season for quantifying happiness

WITH THE happiness of Thanksgiving over we can enjoy a brief pause before the rather more forced happiness of Christmas is upon us. So, in this extended season of goodwill, our happiness should be more or less assured. But, while your happiness outside of work may get a Richter scale rating, it turns out that how happy you are in the office could probably do with a little engineering improvement.

Yes, according to a recent article on the *IEEE Spectrum* site, happiness can be engineered and, needless to say, technology makes this possible. The way to begin understanding how happy people are is not, it turns out, to ask them, because people will usually distort the truth about their emotions. Nope, the solution is to monitor them.

According to the *Spectrum* article, it all started with studies conducted back in the early 'Aughts by MIT professor Alex Pentland using, by today's standards, primitive wearable biometric recorders. This led to a collaboration with Hitachi and, subsequently, a product, the Hitachi Business Microscope (I have to note in passing that Hitachi's website for the HBM is awful and almost completely fails to explain what is, in reality, a very clever and powerful concept and service).

According to *Spectrum*, the HBM data collection is achieved by giving each employee a device the "size of a name tag [that] weighs a mere 33 grams." *Spectrum* explains: "You wear it around your neck on a lanyard, as you would a name badge at a conference. Inside its plastic case are six infrared transceivers, an accelerometer, a flash memory chip, a microphone, a wireless transceiver, and a rechargeable lithium-ion battery that allows the badge to operate for up to two days at a time."

The device collects, over an extended period, the wearer's postural data (arm movements, head nods, etc.) along with voice pitch and volume analysis, as well as data on who is in the vicinity of the wearer and when, along with ambient temperature and light levels. Then, by doing some sophisticated analysis, it can be determined how people in an organization interact with each other and their levels of happiness.

The authors of the article, some of whom were involved in the early research work as well as Hitachi's development, are at pains to point out that, "You might think that happiness is something ineffable, an elusive state of being that defies quantification and analysis. But over the past decade [researchers] have conducted many studies that demonstrate that happiness can, in fact, be systematically measured."

In short, these guys are sort of like Santa: They know when you are happy, they know when you're awake, they know if you've interacted well, when you're tracked for corporate sake.

What is even more interesting is that, from the analysis, recommendations for re-engineering both the physical and social aspects of an organization can be made. While detailed case studies have yet to be published, the *Spectrum* paper claims some interesting results.

Imagine applying this kind of technology in your enterprise ... tracking everyone and their interactions and then doing things such as strategically modifying office layouts and reporting structures to improve the social atmosphere, as well as telling users about their own behavior so they know objectively what they are and are not doing to create a positive work environment.

While it may all sound rather ambitious and maybe even Big Brotherish, there's no doubt that many of us could be a lot happier at work even when it's not Happy Holiday time. ■

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NETBUZZ | BY PAUL MCNAMARA

Taking 'Internet answers' for granted

THAT THERE is nothing unusual about either of these anecdotes is what makes them so remarkable.

First one: For weeks on my Sunday morning trip to the grocery store, I had noticed a large and growing array of ground-based solar panels — dozens of them — just off Route 495 northbound in Westborough, Mass. Each time I've driven by I've asked myself, "What's up with that?" And each week by the time I've gotten home with the groceries I have forgotten to go online and find out.

Until last week: It took me all of 10 seconds on Google to pull up a story from the local newspaper that explained that the solar farm, which will number 3,100 panels when complete, is being built by owners of an office building looking to attract "green" tenants.

The second one: I saw a link to a heartwarming video (doesn't matter which heartwarming video) that was on the front page of Reddit and had already accumulated more than 1,000 votes, which means the video had been watched by many times that many Redditors alone. Yet the view counter on YouTube indicated that the video had been watched only 306 times.

Why? I had noticed this same discrepancy on YouTube at least as often as I'd seen those solar panels, but never bothered to find an answer. Until this time. Another 10 seconds on Google brought me this answer from a YouTube employee via Quora:

"YouTube employs proprietary technology to prevent the artificial inflation of a video's viewcount by spam bots, malware and other means. We validate views to ensure the accuracy of the viewcount of all videos beginning with the first view. This validation process becomes publicly visible when the viewcount reaches 300. At this point, the viewcount may slow or temporarily freeze until we have time to verify that all further views are legitimate. Rest assured that the views system is working as intended, and that the viewcount will update as soon as the system has verified the legitimacy of the views."

I am now assured.

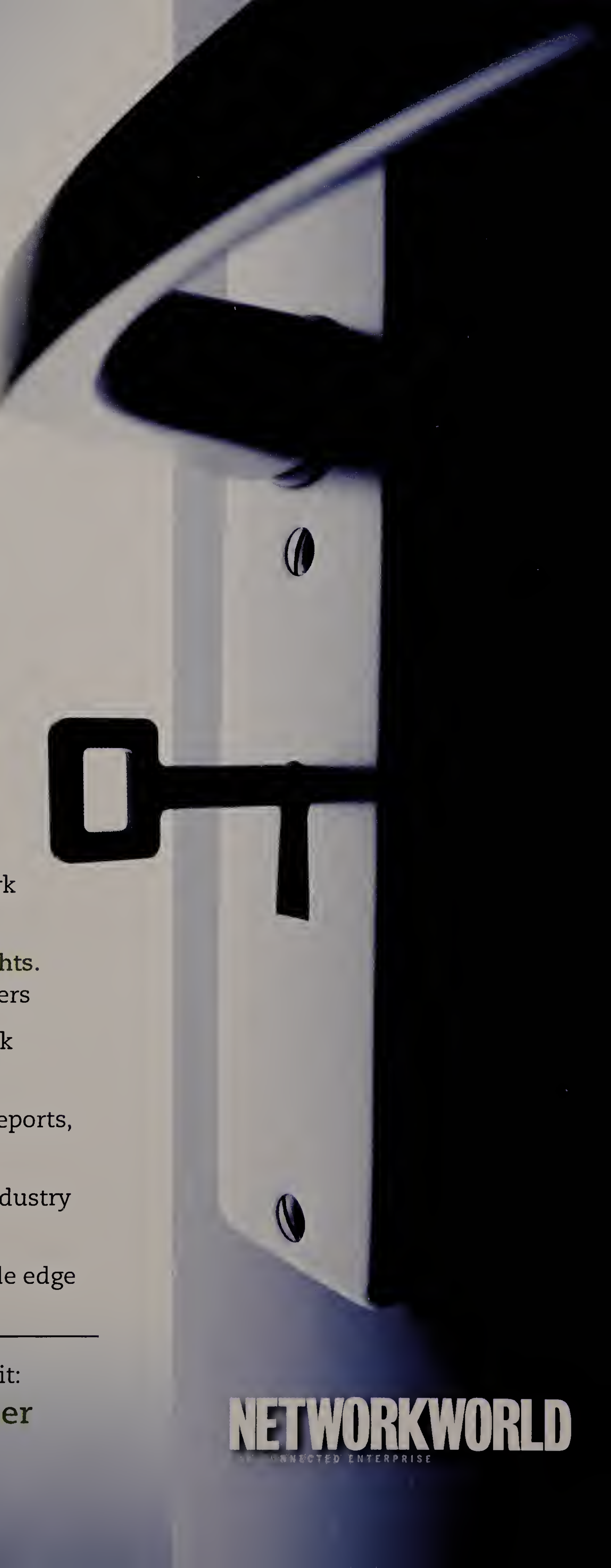
So how would these questions have gone pre-Internet, putting aside the fact that they wouldn't have actually arisen pre-Internet? I suppose I would have been a subscriber to the local newspaper (I worked there for almost 20 years) and maybe the paper would have published a story about the construction just off the highway. Or perhaps I would have called the local library, as library reference desks were once a standard tool for newspaper reporters. Or maybe I would have pulled over into the breakdown lane, hopped the guardrail, and wandered around until I found someone who could tell me what was going on.

More likely I would have gotten over my curiosity.

Today answering such a question more often than not takes an Internet connection and 10 seconds. In fact, answering such questions quickly online has become so reliable that it is the rare occasion when Googling something doesn't work that is truly remarkable.

My 11-year-old children will never know what it's like to have such a mundane question occur yet not have the answer at their fingertips. They take this magic for granted ... I try my best not to. ■

You can always ask me anything. The address is buzz@nww.com.



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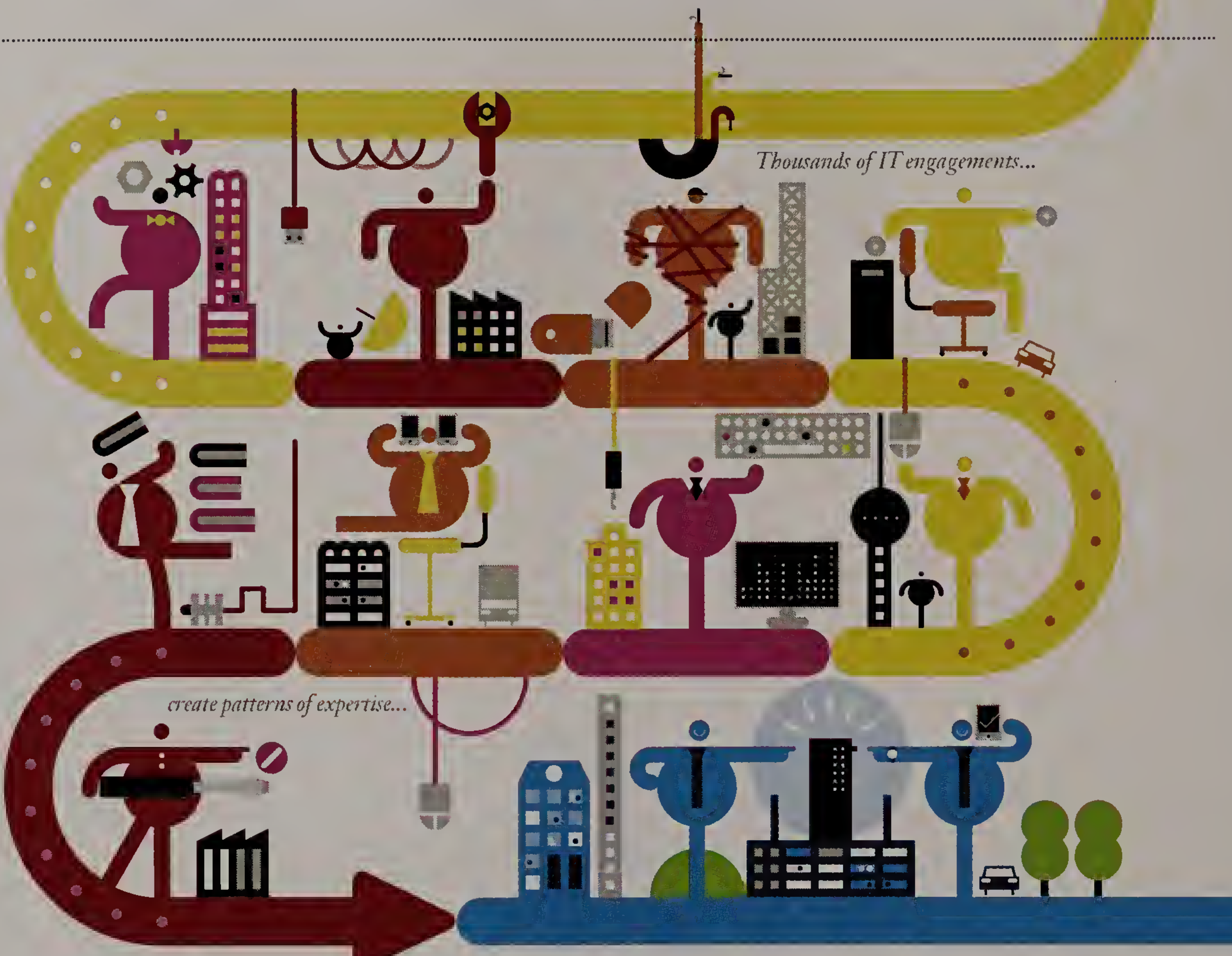
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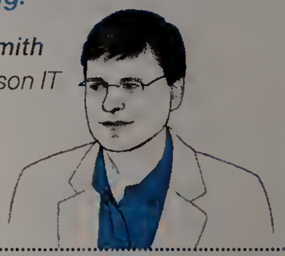
Using patterns established by IBM and leading software vendors, this new breed of expert integrated systems can be up and running in as little as four hours.[2] And once deployed, these systems can automatically scale and adjust resources as the needs of the business change—a process that might otherwise take weeks—freeing IT people to focus on larger, more strategic goals.

> *"It's not going to be about tinkering...It's getting back that thirst to make something."*
>
> *Andrew Smith*
> *VP, McKesson IT*



On a smarter planet, organizations will no longer address complex challenges with generic systems. Instead they can rely on integrated systems with the built-in expertise to help solve them. **ibm.com/simplify**

LET'S BUILD A SMARTER PLANET.

IBM®

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1. Based on a 2011 commissioned study conducted by Forrester Consulting on behalf of IBM. 2. Based upon testing of the IBM PureApplication System W1500-96 with time measured from powering on the system to when it is ready to support application deployments and based upon testing of the IBM PureFlex System Express & Standard models containing one chassis and one compute node with the time measured from powering on the system to when it is ready to support a virtual image deployment. IBM, the IBM logo, ibm.com, PureApplication, PureSystems, Smarter Planet and the planet icon are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. A current list of IBM trademarks is available on the Web at www.ibm.com/legal/copytrade.shtml. © International Business Machines Corporation 2012.